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EPIDEMIC STREPTOCOCCUS SORE THROAT —ITS SYMPTOMS, ORIGIN AND TRANSMISSION *

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Epidemics of streptococcus sore throat have recently sprung up as a scourge, so new that they receive no mention even in the latest editions of our text-books.

Within two years three extensive and alarming epidemics have occurred, which have no counterpart in American medical history. In some respects they call to mind the first severe invasion of influenza, but the latter disease spread everywhere throughout the country, whereas each of the streptococcus sore throat outbreaks was confined to a single community.

It is quite probable, however, that many of our local tonsillitis epidemics, loosely designated as "grip," have in reality been due to streptococcus.

In England comparatively small outbreaks of "septic sore throat" have been described[1] in seventeen localities, and a probable relationship to the milk-supply has been recognized; but in few instances were careful bacteriologic investigations carried out. The streptococcus was first demonstrated in cultures obtained from cases of sore throat in Finchley (1904), where 550 persons were attacked. The *Streptococcus pyogenes* was first detected in the suspected milk in the Guildford outbreak (1903). The following year in the Colchester epidemics, claiming 600 victims, the streptococcus was obtained both in the throat exudate and in the milk. This organism was likewise recovered from the throat and the milk in the Christiania epidemic of 1908, in which 548 persons fell a prey to the disease.

The existence of mastitis in the cows was noted in all four of these foreign outbreaks.

The American epidemics of streptococcus sore throat were carefully studied from a clinical and bacteriologic point of view, and many new facts bearing on the etiology were brought to light. A brief summary of the salient features of these outbreaks may be profitable.

Extent of Epidemic.—About 1,400 persons were stricken in the Boston outbreak, and of this number 1,043 were investigated. In Baltimore about 1,000 were affected and 602 recorded. The total in Chicago was estimated to be over 10,000, though only 1,271 were studied.

The Organism.—In all three cities a peculiar type of hemolytic capsulated streptococcus was secured from throat cultures or from the peritoneal exudate of fatal cases. Davis compared cultures from each outbreak and found them practically identical.

Season.—The cases appeared in the winter and spring months, occurring in Chicago during the last of December and in January, in Baltimore during March, and in Boston during May.

Explosive Outbreak.—A sudden appearance of a large number of cases was characteristic of each epidemic. Often several members of a household were taken ill almost at the same time, suggesting a common source of infection rather than dissemination by personal contact.

Clinical Symptoms.—The sore throat manifestations were similar in all epidemics. Intense hyperemia with or without a grayish exudate was the usual picture.

Enlargement of the cervical lymph-nodes was one of the most characteristic symptoms, occasionally resulting in suppuration. Extreme prostration and a tendency to relapse were emphasized by most observers.

The three epidemics reveal a striking similarity in the complications. Otitis media, peritonsillar abscess, erysipelas or some other form of skin eruptions and nephritis were common sequels. Arthritis, endocarditis and myocarditis occurred in many cases. Pleurisy and pneumonia often ushered in a fatal septicemia. But the most dangerous and remarkable complication was peritonitis, which was responsible for a great number of deaths.

Relationship to Milk.—The infection was traced definitely to a single milk-supply in every city. The sore throat cases traced to one dairy made up 70 per cent. of the total in Boston, 65 per cent. in Baltimore and 72 per cent. in Chicago. As the suspected dairy in each instance supplied only a small proportion of the city consumption, these percentages become highly significant. There is no doubt that secondary cases developed by means of contact, but it quite overturns our accepted theories of transmission to observe that the secondary contact cases were few compared with the number of cases directly infected by the use of milk.

As this fact was established in all the epidemics we must in the future revise our notions concerning the importance of contact in the dissemination of streptococcus infections.

Ultimate Sources of Contamination.—The indictment in each of the epidemics against a single dairy as the carrier of the germs was so strongly supported by clinical facts as to be final and conclusive.

The evidence submitted to show when and how the milk became infected may be considered under the following classification:

1. Streptococcus in the mixed milk at the collecting plant or at the farm.
2. Mastitis in cows, from whose udders streptococcus is directly obtained.
3. Streptococcus sore throat in the milkers.

*Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Savage, W. G.: Milk and the Public Health, Macmillan & Co., London, 1912

4. Streptococcus sore throat in other employees who handle the milk.

In his study of the Boston epidemic, Winslow[2] found no evidence of cattle disease and no well-defined cases of sort throat in a milker. He did discover, however, cases of sore throat in employees at the farm and dairy. The actual infection he attributed to a human carrier.

Stokes[3] succeeded in obtaining more definite information in the Baltimore outbreak. He found the streptococcus epidemic in the raw mixed milk of one herd but could not trace the infection to the cow. There was no history of septic sore throat cases among the farmers or employees. Although final proof was lacking, Stokes expressed the belief that the infection originated in the cows.

Investigations in the Chicago epidemic revealed the *Streptococcus pyogenes* in the milk obtained directly from the inflamed udder of the cow and also in cultures taken from a milker with sore throat. A history of septic sore throat among employees was also established.

Direct contamination of the milk by human carriers does not offer a satisfactory explanation of these epidemics, because such a contamination is likely to be casual and occasional, whereas the outbreaks indicate a continuous infection for a few weeks. Furthermore, the amount of infectious material introduced by a human carrier in coughing, etc., is relatively small to produce such appalling results.

A mastitis infection with streptococcus, on the other hand, would entirely explain the continuous stream of milk contaminated with enormous numbers of organisms.

A comparison of the American epidemics does not indicate at first glance that the source of infection was the same, because mastitis was not found at all in the Boston herds, and only a non-pathogenic form of garget was discovered in Baltimore.

These apparent discrepancies, however, may be cleared up by recent investigations. Davis[4] has succeeded in producing in the udder of a healthy cow an infection with a human strain of *Streptococcus hemolyticus.* The germs, introduced through a slight abrasion of the teat by the contaminated hand in the act of milking, caused an ascending infection of the teat and udder, characterized by the presence of pus and myriads of streptococci that persisted for two or three weeks. Strange to say, there was no caking of the bag. We cannot therefore place any dependence on caked bag as a necessary accompaniment of mastitis. Streptococcus mastitis without caking may well have existed in some of the cows in the Boston or Baltimore herds and yet have escaped detection.

In the future, it will be necessary to examine the milk from each cow in a suspected herd for pus and streptococci.

I believe that streptococcus mastitis will be recognized as the most important source of extensive epidemics of septic sore throat. That the mastitis may originate by transmission of human streptococcus through the medium of the milker seems to be established. Whether or not mastitis due to a specific bovine streptococcus may become virulent to man is a problem yet to be determined. When we come to a consideration of prophylaxis all other measures and precautions sink into insignificance when compared with thorough pasteurization. A general enforcement of pasteurization would put an end to a malady that otherwise promises to be one of the most formidable and wide-spread of the infectious diseases.

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2. Winslow, C. E. A.: An Outbreak of Tonsillitis or Septic Sore Throat in Massachusetts, and Its Relation to an Infected Milk-Supply, Jour. Infect. Dis., 1912, x, 111.

3. Stokes, W. R., and Hachtel, F. W.: Septic Sore Throat, a Milk-Borne Outbreak in Baltimore, Pub. Health Rep., 1912, No. 103, p. 44.

4. Davis, D. J.: Communication read at the American Society for Clinical Investigation, Washington, D. C., May 5, 1913.

CHRONIC STREPTOCOCCUS ARTHRITIS*

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The relation of streptococci to arthritis is a very broad one. The highly acute purulent inflammation of joints which may be simply part of a general streptococcus pyemia or septicemia is well known and fairly well understood. It occurs in connection with severe streptococcus infections, such as puerperal fever, infected wounds, erysipelas and common infectious diseases. Of the latter I shall mention especially septic sore throat as it has been observed by Capps and others in connection with milk-borne epidemics. In all of these there is a tendency, at times not very marked, but at other times striking indeed, for the streptococci to produce arthritis.

The tendency on the part of streptococci to localize in joints of experimental animals seems to concern the several varieties, though to an unequal extent. The common hemolytic streptococci and the *Streptococcus mucosus* readily attack joint cavities; the *Streptococcus viridans,* on the other hand, rarely does so. The *Diplococcus rheumaticus* is also very prone to attack joints as shown by Poynton and Payne, Beattie, and especially by Rosenow's recent work. The streptococcus found in septic sore throat, which appears to be a highly virulent variety of the hemolytic streptococcus, readily produces multiple arthritis in animals with often other lesions such as endocarditis, pericarditis, myocarditis, peritonitis, etc. This agrees with the occurrence of the serious complication in human beings observed during these milk-borne epidemics.

The subacute or chronic types of arthritis leading toward some permanent change in the joint or periarticular structures form a large and miscellaneous group of joint disorders, and their classification is as yet imperfect and unsatisfactory. "Arthritis deformans" is, perhaps, the term most commonly applied to them. Their etiology is undoubtedly manifold and they probably furnish an illustration in which similar and often indistinguishable pathologic changes and clinical symptoms are brought about by widely different agents. From this large group in recent years, however, certain smaller groups have been separated; for example, traumatic arthritis deformans and certain cases of gonococcal arthritis. In other words, as soon as the true etiology of a case, or group of cases is discovered it is removed from this large group of arthritis deformans to a class or group designated by its etiologic agent.

In this paper I wish to discuss chiefly from an etiologic point of view a certain group of these cases of chronic arthritis or arthritis deformans whose cause can with fair definiteness be attributed to a streptococcus infection, usually though not always originating somewhere about the upper respiratory passages. I believe that it is often possible to separate these cases clinically and

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especially by the history from deforming arthritides of other origin. Etiologically also I believe that these cases can and should be at present placed in a group by themselves and removed from the larger and more miscellaneous group of arthritis deformans.

The clinical symptoms of these cases, though often indefinite, still possess certain features which are more or less characteristic. It has been common to speak of an acute and a chronic form or type of deforming arthritis. This is done, for example, by McCrae in his excellent article on this subject in Osler's "System of Medicine." The chronic form in general tends to progress slowly and gradually without definite exacerbations or recurrences. The more acute or subacute form often has a rather sudden onset with some fever and involvement frequently of several joints. Such attacks tend to subside and recur, often closely resembling acute articular rheumatism, with which I believe it is not uncommonly confused in the early stages. The joints may be red, swollen, painful and tender; or the attacks may be light and the patient may experience only slight and transient pains and perhaps some stiffness in the joints. In contrast with acute rheumatic fever, salicylates have little or no effect, especially early in the disease.

The striking feature in these cases, however, is the persistence of the symptoms and the tendency to more or less permanent change in the joints. This is the chief differentiating feature from acute rheumatic fever. Not uncommonly heart murmurs and distinct endocarditis may develop in these cases during or following the recurrences. In common with acute articular rheumatism is the fact that the attacks and exacerbations are often preceded or appear simultaneously with an attack of tonsillitis or pharyngitis. An infecting focus may appear in other parts of the body, but the pharyngeal ring seems to be by far the most common atrium.

The history of tonsillitis in these chronic cases just preceding or simultaneous with the onset is of great importance in the diagnosis and may be sufficient in itself to determine how the case should be managed. I wish again to emphasize, however, that border-line cases are common and it is difficult or impossible at times to determine whether or not they belong to this group. Furthermore, the occurrence of a focus such as diseased tonsils or infected teeth and arthritis in the same person does not necessarily mean that the processes are directly related. They may or may not be.

A report[1] has already been made on the bacteriologic and pathologic study in some of these cases, and here I wish to present further data more especially on points which concern the specificity of streptococci as causative agents.

I have had an opportunity to make observations in forty-two cases which I think may be placed in this group of arthritides and in which the atrium of infection appeared to be in diseased tonsils. Other cases of chronic arthritis have been observed and studied in which the atrium apparently was in other locations, such as the teeth, urinary tract, etc., but these I do not wish to consider at this time. In all the cases with one or two exceptions the tonsils were removed and cultures made from the crypts. From thirty-eight a hemolytic streptococcus was grown and in the great majority in practically pure cultures. A point that I wish to call especial attention to is the occurrence of these cocci in the crypts often to the exclusion of other bacteria. To demonstrate this, careful cultures must be made from the depths of the crypts after the tonsil has been incised with a sterile knife. Surface cultures or cultures made from badly lacerated tonsils give usually many buccal cocci chiefly of the *Streptococcus viridans* type.

In some of the patients joint effusions appeared at some time during the course of the disease. In four patients careful examination of the aspirated fluid in smears and cultures revealed no bacteria of any kind. Leukocytes were few in number. Blood-cultures made in ten cases did not yield positive results. These data are in agreement with the reports of many other workers on this subject. This does not mean that bacteria may not be found at times in the blood or that the bacteria may not be constantly present in or about the joints. As animal experiments show, the exudate especially in old joint lesions is often sterile so far as cultures indicate. On the other hand, smear preparations carefully made may show a few cocci.[2]

The tonsils in these cases may or may not be enlarged. While usually they are somewhat hypertrophied, often they are small and at times submerged. The latter are dangerous because they are easily overlooked. Proper drainage in such organs is naturally interfered with. The color is often diffusely red or bluish-red; at times large hyperemic areas appear. On slight pressure there may be a purulent exudate from the crypts consisting of pus cells and diplococci. It should be stated also that in some patients there is nothing in the appearance of the tonsil to make one suspect a pathologic condition. In a number of cases the tonsils had been at some previous time only partially removed or sliced off with a tonsillotome. Such operations are not only not effective but are positively harmful on account of the formation of fibrous tissue at the cut surface which tends to occlude the crypts and prevent drainage.

Microscopic examination of the tonsils usually reveals clusters of polynuclear leukocytes in the crypts and especially in the epithelium lining them. At times infected foci occur beneath the epithelium and small abscesses may appear in the tissue. The blood-vessels may be hyperemic, and plasma-cells about vessels and beneath and in the epithelium are always present.

The streptococci cultivated from the diseased tonsils have been carefully studied. Not all are identical, but they evidently belong to the general group of hemolytic streptococci.

Most of these organisms have a moderately wide, clear zone of hemolysis on blood-plates, though there is considerable variation in the width of zone. The colonies are small and gray and have little tendency to spread. They are not mucoid or watery, and the cocci are not encapsulated. They do not ferment inulin, and some ferment mannite and others do not. None ferment raffinose and their reaction on lactose is not constant; most of the strains ferment it; a few do not.

Some of the streptococci found in certain cases have a much narrower zone of hemolysis which also may be slightly grayish or turbid. The margin is less distinct and the colony smaller. The difference between this and the first streptococcus mentioned is sufficient to enable one to separate them, especially when they occur on the same plate. Morphologically the cocci are perhaps slightly smaller and as a rule, though not always, form shorter chains than the other streptococci. They may produce arthritis when injected into animals in large

1. Davis: Jour. Infect. Dis., 1912, x, 148.

2. A careful study is now being made both in animals and in man with a view to clear up the point as to the presence of cocci in or about chronic arthritic joints. A hemolytic streptococcus has already been cultivated from the synovial membrane obtained from a case of chronic arthritis in which Dr. McArthur operated. This organism readily produces arthritis in rabbits.

doses, but they are as a rule not highly virulent. They were found in a number of cases associated with the more hemolytic variety and sometimes they appeared practically pure. While often the differentiation of the two kinds is clear this is not always so, and not infrequently intermediate or transition forms were seen.

When the streptococci are injected in sufficiently large doses (one or two blood-slants) intravenously into young rabbits, they invariably localize in or about the joints, producing as a rule multiple arthritis. This condition has been produced in over two hundred animals. In a sense the cocci are not highly virulent, large doses (several tubes) being necessary to kill guinea-pigs by intraperitoneal injections. The joints most commonly affected in the animals are the wrists, phalanges, knees and ankles, though practically every joint in the body is at times involved. The infection in the joints usually appears a few days after inoculation and continues for from one to three weeks or longer. Relapses may occur. Not infrequently the changes in the joints become chronic with considerable deformity, and with the formation of exostoses, lipping of margins and other hyperplastic changes. At times such animals live for many months, becoming badly deformed and crippled and ultimately dying in an emaciated condition.

Early in the course of the infection in these animals, cultures from the joints usually yield streptococci. They tend to disappear and at times even after the second or third day no growth may be obtained. In the chronic joints after weeks or months the streptococci may still be found in the exudate, though often they are not. The exudate early is slimy, mucoid and glairy, later becoming more purulent. In very old joints it may be gelatinous in character.

In about 10 per cent. of the animals so inoculated a definite endocarditis results. Also occasionally a fibrinous pericarditis is seen (observed five times). A careful histologic study of these joints and the heart lesions have been made by Dr. Leila Jackson[3] in the pathologic laboratory of St. Luke's Hospital. In the heart muscle Jackson often finds focal lesions consisting of clusters of round cells and, in older lesions, of peculiar large giant-cells. In these nodules cocci may be found especially early, in large numbers. A striking feature of these lesions is the relative absence of a regional leukocytic infiltration. Jackson likewise finds peculiar and characteristic nodules in the periarticular structures and in the synovia. The bacteria enter the joint cavities as early as ten hours after intravenous injection apparently from the rich meshwork of synovial capillaries in the lateral plicae. In the ends of the bones, especially about the epiphyseal cartilages, at times definite infarcts due to bacterial emboli are seen extending toward the joint, usually subjacent to the periosteum. These experimentally produced lesions in animals bear certain resemblances to lesions described by other writers in the heart and joint structures of man in cases of acute rheumatic fever.

It should be pointed out that hemolytic streptococci may occur in the crypts and on the surface of tonsils not only in ordinary streptococcus tonsillar infections but also in normal tonsils. These streptococci often cannot be distinguished from the streptococci found in the tonsils of those patients suffering with joint trouble. Consequently the presence of streptococci in cultures should be carefully interpreted. They may or may not be significant, just as finding pneumococci in the throat or sputum may or may not be significant for the diagnosis of lobar pneumonia.

I shall refer to the therapeutic side of this subject largely on account of its bearing on the etiology as manifested by the "constitutional reactions" following extirpation of infected foci and the administration of autogenous vaccines. In this group of forty-two cases there was an opportunity to follow nearly every patient for a considerable period of time. As generally conceded now by those who have had most experience, the value of focal extirpation is unquestioned. The observations of Dr. Billings, who saw many of the cases here reported, may be referred to. In nearly every patient in this series marked improvement appeared and often complete cure resulted from the enucleation of the tonsils. The recovery was gradual as a rule. Naturally marked bony ankylosis and extensive fibrous change could not be essentially altered or modified. In about one half of the cases vaccines were prepared from the streptococci isolated from the infected focus. On the whole, the progress of cases so treated seems to indicate that the improvement is hastened by the use of these vaccines.

In some patients the vaccines acted like a specific. As an illustration let me cite an instance. A patient (case of Dr. Arthur Elliot) had suffered for the past three months with severe and progressive arthritis involving many joints of both upper and lower extremities and certain vertebral joints. The trouble began with an attack of sore throat and simulated in some respects acute articular rheumatism. Blood-culture was negative, leukocytes 11,400. The tonsils were removed and found pathologic. Cultures carefully made from the crypts of both tonsils gave an absolutely pure growth of hemolytic streptococci. An autogenous vaccine was prepared and 200 million were given in the first dose. Eight hours later the patient reacted rather sharply and severely. He felt chilly and there was a degree or two of fever. All the involved joints became distinctly more tender and some were swollen. This condition lasted for about two days, and then subsided rather rapidly. With this there was marked improvement in the patient's condition. At five-day intervals three doses of vaccine were given and in about two weeks or less the joints had assumed almost their normal condition.

In a number of instances this prompt reaction or hypersusceptibility after relatively small doses of dead autogenous streptococci has been noted, and it corresponds undoubtedly with the reaction that has been observed in other infections, for example, by Irons in gonorrheal arthritis after injections of gonococci. Not all cases by any means show it. I think that in those that do the improvement on the whole is more prompt and rapid. Attention is here called to the fact that this reaction would seem to be conclusive proof of the specificity of the streptococcus in such arthritides.

Another point of interest is that in three instances acute attacks or exacerbations followed the tonsillectomy almost immediately. This phenomenon has been noted occasionally by many observers and is undoubtedly due to a dissemination in the circulation of infectious material by the operation. This is another argument in favor of the arthritic process being infectious and located primarily in the tonsils.

The value of vaccines was also demonstrated in one case in which it was impossible to remove the diseased tonsils on account of high blood-pressure. The man had a very serious chronic polyarthritis for nearly a year.

3. Jackson, Leila: Experimental Rheumatic Myocarditis, Jour. infect. Dis., 1912, xi, 243. Experimental Streptococcal Arthritis in Rabbits, ibid., 1913, xii, 364.

The joints were swollen, stiff and painful. A hemolytic streptococcus was isolated from material obtained from the tonsillar crypts, and a vaccine prepared and used. In the meantime the tonsils were treated. Following the vaccine, improvement began promptly and resulted in complete relief except for a slight but painless ankylosis in one wrist.

In connection with the use of vaccines I may state that in no instance was there the slightest evidence of any harmful results following their administration. Excessive doses were avoided and the interval was usually from five to seven days.

The more important points that I would like to bring out in this paper may be summarized as follows:

In this group of cases the fact that in the majority the tonsils are found diseased, the fact that an acute tonsillitis often ushers in an attack and the fact that the removal of tonsils in some cases brings on an acute exacerbation, all point to the tonsil as the common atrium of infection. Other atria exist, of course, but are relatively rare.

Extirpation of the diseased tonsil or focus leads commonly to marked improvement or to complete relief. This points to the tonsil as a focus from which infectious material is being constantly disseminated.

In the diseased tonsils a hemolytic streptococcus is found in nearly all cases, often in pure culture.

This streptococcus invariably produces arthritis in animals. The arthritis may become chronic leading to marked deformities, exostoses, atrophies and hyperplasias of joint structures in animals.

After injection of moderate doses the dead autogenous streptococci may cause acute reactions manifested by swelling, redness and tenderness of the involved joints. This fact points to the streptococcus as the cause of the arthritis. The value of autogenous vaccines in the treatment of many of these cases seems unquestionable, which is also an argument in favor of this streptococcus being the causative agent.

The fact that streptococci from other sources, for example, erysipelas, tend to localize in joints and produce similar lesions when injected into animals should not be used as an argument against the streptococci found in diseased tonsils or other foci being the causative agent in these cases. It is rather an argument for it. Susceptibility of the tissues of the host may in these cases be far more important than specificity of the infecting streptococcus.

The streptococci from these arthritic cases have not been clearly differentiated from streptococci from other sources by the various methods we are able to apply. On the whole, they are probably not so virulent as ordinary pyogenic streptococci.

The group of cases discussed in this paper can be fairly definitely separated both clinically and etiologically from the more miscellaneous group of arthritis deformans on the one hand, and acute rheumatic fever on the other. It would seem appropriate to refer to them as chronic streptococcus arthritis.

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Why Register Deaths?—It seems to me that there is almost nothing more important in the entire field of statistics than vital statistics, because of their direct bearing on the health and consequent welfare of the people.—E. Dana Durand, Director of the Census, Washington, D. C.

A BIOLOGIC CLASSIFICATION OF PNEUMOCOCCI BY MEANS OF IMMUNITY REACTIONS*

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The early work of Koch on etiology led him to formulate certain laws which he demanded should be fulfilled before the relationship of any micro-organism to disease could be regarded as satisfactorily established. Subsequent students have sought to fulfil the requirements of Koch, and the result has been that with the elucidation of each well-recognized infection, a single bacteriologic unit has become accepted as the causative agent. Bacteria, however, are not strictly limited in the pathologic process which they induce, and the lesion caused by a single variety may vary somewhat with its location in the animal body. The pathologic and clinical study of disease is, however, so extensive to-day that the various types of activity of the same bacterial race have been thoroughly described and correlated, so that the nature of the infectious agent can in most instances be assumed from the character of the pathologic process.

From the demonstration by Pasteur of the causal relationship of bacteria to disease, and the evidence of Koch that most infections are caused by bacteriologic units, has come the hope that at some time bacterial diseases may be controlled by specific methods. The increasing study of bacteriology and the practical application of bacteriologic immunity to human disease have made it evident that, in addition to the grosser classification of which bacteria are susceptible, certain finer characteristics exist which serve to differentiate still further members of the same bacterial species. In some instances, certain growth phenomena, such as cultural or fermentative reactions, are sufficient for differentiation; others require the extraordinarily specific methods that have developed from the study of immunity. Although, from the point of view of etiology, the drawing of such fine lines of division may be relatively of minor significance, from that of specific therapy these differences are of primary importance. How numerous and important are the varieties of the main bacterial races is not very well known at present. Most investigators recognize the probability of such a condition, and in the specific bacterial and serum therapy of the day, an attempt is made to cover all possibilities by the use of polyvalent vaccines and immune serums. Such serums and vaccines are, however, prepared without much forethought; heterogeneous collections of organisms are used, and difference in origin is the only standard of differentiation of the various strains employed. In such a method, many individuals may be superfluous, and, on the other hand, some important members of the species may be lacking. In this paper we shall report the results of a biologic classification of the pneumococcus, using in the main certain immune reactions for purposes of differentiation.

For the past three years, we have been engaged in a study of lobar pneumonia at the Hospital of the Rockefeller Institute. The problem in the beginning was approached with a view of obtaining, if possible, a specific therapy. The work of Neufeld[1] and his associates has demonstrated the existence of certain varieties of

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1. Neufeld and Haendel: Arb. aus d. Kais. Gesund., 1910, xxxiv, 293.

pneumococcus which, in regard to certain of their immunologic reactions, are fundamentally different. In recognition of the importance of this fact, a study of all pneumococci obtained from human cases has been made. Immune reactions have been chosen for purposes of differentiation because of their peculiar specificity and important practical bearing, and because of the inconstancy of morphologic and cultural differences of strains of pneumococcus. A primary classification has been obtained by means of protection experiments. All the strains of pneumococcus, as soon after isolation as sufficient virulence was attained, have been tested for their susceptibility to the action of serums prepared by immunization of animals to single varieties. White mice were used as experimental animals, and the various mixtures of serum and culture were injected simultaneously into the peritoneal cavity. The results were seldom doubtful. If the organism tested belonged to the same group as that from which the serum had been derived, as great a degree of protection was usually afforded as that manifested against the homologous organism. On the other hand, when a strain belonged to a different group, little or no protection was evident, the tested animals dying for the most part within the same time as the controls. The results obtained from testing different strains in the manner described are shown in Table 1.

TABLE 1.—CLASSIFICATION BY PROTECTION

	No.	Per Cent.
Group 1	28	45
Group 2	12	20
Group 3 (mucosus)	9	14
Group 4 (heterogeneous)	13	22
Total typical	49	78
Total heterogeneous	13	22
Total	62	

In this table are enumerated in detail the results obtained from testing the protective power of two different immune serums derived from typical organisms. Preliminary work had previously shown that the two strains of pneumococcus chosen for immunization were probably the ones most frequently associated with lobar pneumonia. In the main the differentiation obtained by protection is sufficiently evident to permit a satisfactory classification. In all, sixty-two different strains have been tested against the two types of immune serums. Of the sixty-two strains, forty, or 64.5 per cent., were susceptible to the action of one or the other type of immune serums. On the other hand, twenty-two strains were either completely unaffected by the immune serum or so little influenced as to render inclusion in either of the typical groups unjustifiable. Of the organisms which could be classified by the protection reaction, twenty-eight, or 45 per cent., of the whole number of strains studied responded to the protection of serum Type 1, and shall be called Group 1. The Type 2 serum exhibited protection against twelve strains, 20 per cent. of the whole number studied. These organisms are classed as Group 2. Of the twenty-two strains not materially influenced by the protective action of the serum, nine were easily differentiated by their distinguishing cultural and pathogenic qualities into a group which we have called Group 3, exhibiting the characters of the so-called *Streptococcus* or *Pneumococcus Mucosus*. These organisms are highly pathogenic for white mice and are completely insusceptible to the action of either of the immune serums in our possession. The remaining thirteen strains must be considered as forming a heterogeneous group, designated as Group 4. These organisms do not possess cultural characters that evidently distinguish them from either of the typical groups, and, although one or another of the serums studied may show slightly increased protection, this is so small when compared with the known protective value of the serum that it does not justify inclusion in the typical groups. These differences are further emphasized later in the discussion of the results of agglutination experiments. The results of the work on protection show the existence of four general groups of organisms as the causative agents of lobar pneumonia. Groups 1 and 2 are made up of organisms that are identical from the point of view of protection with other members of their respective groups. Group 3, *Pneumococcus mucosus*, is formed of organisms having distinctive growth characters. Whether or not further classification of this group is possible by means of immunity reactions has not yet been determined because of the difficulty of obtaining satisfactory immune serums against these organisms. Group 4 has no completely distinctive morphologic or cultural characters, and, as is shown later, consists of a heterogeneous collection of isolated individuals.

AGGLUTINATION

A historical discussion of the studies of agglutination of pneumococcus does not seem necessary in this paper. It is sufficient to state that the pneumococcus is agglutinable in specific immune serums, and that evidence in regard to the demonstration of the existence of different varieties by this reaction is contradictory. Pneumococcus does not always agglutinate readily in high dilutions of immune serums. Fortunately, however, it has the property of remaining suspended or growing diffusely in practically pure normal or heterologous serums, so that serum of considerable strength can be used to bring out specific differences. In the following study, serum and twenty-four-hour broth-cultures of the organism were mixed together in equal quantities. The reactions were read by the macroscopic method after one or two hours at 37 C. (98.6 F.), and again after twenty-four hours at either 37 C. or room temperature. Agglutination usually begins to be visible in from fifteen minutes to half an hour, and appears first as a fine granulation of the suspension; the clumps finally sink to the bottom of the tube and in the end usually form a firm, scale-like mass in the bottom of the tube which cannot be broken up, even by vigorous shaking. If the mixtures are allowed to stand for twenty-four hours at 37 C., a precipitation of serum and organisms sometimes occurs in the control tubes which, however, after a little experience is easily distinguishable from a true agglutination. In control tubes, even when such a precipitation occurs, the majority of the cocci remain freely suspended, whereas when specific agglutination develops, the supernatant fluid always becomes perfectly clear. The organisms studied were tested against the same two types of serums used for the protection experiments, and the results obtained are shown in the Table 2.

Study of the agglutination reactions of these strains of pneumococci shows that specific differences can be brought out by this method between individual members of a collection of organisms. The strains again fall into definite related groups, and the percentage of distribution is about the same as that obtained in protection experiments. In every instance in which an organism could be definitely placed by protection in one of the groups described, the agglutination reaction has corre

sponded with this classification. Two strains, 56 and 86, showed doubtful protection with both types of serums, but on agglutination reacted specifically with serum Type 1.

TABLE 2.—CLASSIFICATION BY AGGLUTINATION

	No.	Per Cent.
Group 1	22	41
Group 2	11	20
Group 3 (mucosus)	9	17
Group 4 (heterogeneous)	12	22
Total typical	42	77
Total heterogeneous	12	23
Total	54	

By the methods of protection and agglutination, it has been possible to classify the pneumococci associated with lobar pneumonia in man into four groups. Groups 1 and 2 consist of members closely related immunologically to other members of their respective groups. Group 3 is formed of *Pneumococcus* or *Streptococcus mucosus*. Of nine members of this group studied, eight possessed the common characters of pneumococcus in addition to the quality of forming mucus, and one those of streptococcus. The latter organism was insoluble in bile, failed to ferment inulin, hemolyzed blood mediums, and exhibited other characteristics of *Streptococcus longus*. It formed, however, abundant mucous exudate in animals, grew in large mucoid colonies and showed well-developed capsules. A study is now in progress to determine whether or not immunologic differences exist between individual members of the mucous group. The fourth group consists of heterogeneous members, and a further study of this group appears later. All the strains of pneumococcus examined were studied by the usual cultural methods. Although average cultural and morphologic differences exist between the different groups, these are variable and are not reliable for purposes of identification, except those of *Pneumococcus mucosus*. All the strains studied, except the *Streptococcus mucosus* mentioned before, were either bile-soluble on isolation or have become so on animal passage. Fermentation of inulin is not more characteristic of one group than another. Capsules are somewhat easier to demonstrate among members of Group 1 and *mucosus* than in Group 2 and the heterogeneous group. The average morphology of the various groups shows some differences. In Group 1, individual cocci are medium-sized, slender and show a slight tendency to rounded ends. Individuals of Group 2 are larger, fairly broad and almost invariably show perfect lancet-shaped forms. The morphology of *Pneumococcus mucosus* is quite characteristic, showing voluminous capsules containing medium-sized, closely approximated cocci with definitely rounded ends. In general, members of the heterogeneous group tend to exhibit pairs of rounded individuals, but may resemble completely either Group 1 or Group 2. The virulence for mice of strains of the typical Groups 1 to 3 is usually higher and more constant than that of the heterogeneous Group 4. A continuous study of a number of members of the different groups may thus bring out certain more or less characteristic differences. These, however, are not constant, and cannot be depended on for purposes of classification.

The frequency with which the different types of pneumococcus appear as the cause of lobar pneumonia is of considerable interest. Altogether it has been possible to obtain a biologic classification of the pneumococci from seventy-four cases of typical lobar pneumonia. In thirty-five instances, 47 per cent., the organisms belonged to Group 1; in thirteen instances, 18 per cent., to Group 2; in ten instances, 13 per cent., to Group 3 (*mucosus*) and in sixteen instances, 22 per cent., to Group 4 (heterogeneous). Almost one-half the cases of pneumonia which we have seen are due to pneumococci belonging to Group 1. Members of the other groups occur less frequently. In 78 per cent. of the cases examined, the organisms obtained have possessed distinguishing characteristics which permit a definite biologic grouping. The remainder do not have distinctive common immunologic or growth characters and must be classed as heterogeneous. Immune serums have been prepared with organisms from Groups 1 and 2, and apparently all members of these two groups are susceptible to the protective and agglutinative action of these serums. The immunity reactions of Group 3 (*mucosus*) have not as yet been completed.

Group 4 has been called heterogeneous. The reason for this classification is shown in the following study: Animals were immunized to various members of this group and the immune reactions which had been found to be common to members of Groups 1 and 2 were studied. So far, it has not been possible to protect animals against any of the heterogeneous strains, when serum derived from another strain has been used. The immune serums obtained protected against only the homologous organism. An example of the method employed is shown in Table 3. The immune serum was obtained by immunization of an animal to Pneumococcus 71. The cultures used for infection were twenty-four-hour broth-cultures, freshly obtained from passage through animals. Culture and serum were injected simultaneously into the peritoneal cavity of white mice.

Certain other strains belonging to the heterogeneous group have been tested in the same manner, and in no instance has any cross-protection been observed. From Table 3 it is seen that not only does Serum 71 fail to afford any protection against heterologous strains, but in some instances even increases the fatality of the smaller doses of culture. The serum, however, possessed a high protective power against the homologous organism. The condition of affairs is, therefore, quite different in this group from that observed in Groups 1 and 2. In the latter a serum derived from one member of the group seems to protect animals against infection with all other members of the group, whereas in the former, no instance of cross-protection has been observed.

In addition to the protection reactions, cross-agglutination among members of this group has been carefully studied. The technic employed was the same as that previously described. The results are shown in Table 4.

In this table the results obtained from testing fourteen different strains against serums derived from eleven of the strains are presented. The agglutination reaction has again confirmed the results of protection experiments. In only one instance was cross-agglutination observed, Pneumococcus 55 by the polyvalent serum obtained from Pneumococci 34, 38 and 71. In two other instances, Pneumococci 37 and 52, agglutination occurred in heterologous serum, but the reaction took place much more slowly than that of the homologous organisms. The study of cross-protection and agglutination among members of the heterogeneous Group 4 indicates that this group comprises a number of distinct varieties of pneumococcus which cannot be related to one another by immunologic reactions. Culturally they are true pneumococci and manifest all the common characters of pneumococcus.

The study of certain biologic reactions of a large number of strains of pneumococci isolated from cases of pneumonia in man has developed some interesting facts. The organisms studied fall into two general groups. One of these, containing a large majority of all strains investigated, consists of three apparently fixed races, and the other of a smaller number of strains, each of which seems to form a distinct variety. The individual members of two of the fixed races (Groups 1 and 2) can be distinguished certainly from one another only by means of highly specific immune reactions. Single strains, however, belonging to either of these two groups have immune reactions in common with all other members of the particular group to which they belong. The other apparently fixed race consists of the organisms designated as *Pneumococcus mucosus*. Although the latter classification has been based on cultural reactions and does not exclude the existence of different varieties, from the point of view of immunity, incomplete immunologic studies indicate that most of these organisms can also be further related by means of immunity reactions. In striking contrast to these three groups is the fourth or heterogeneous group, which seems to consist entirely of isolated individuals. The significance of such a situation is difficult to interpret. Whether this mixture is being progressively differentiated into groups with common characters, or whether each member is a descendant of one of the fixed groups that has undergone a fundamental change by being forced to adapt itself to some special environment, cannot be determined from the evidence at hand. It is not impossible that the fixed races are more highly parasitic and are never very far removed from a condition of pure parasitism, whereas the heterogeneous strains may be representatives of the type of pneumococcus found in the normal mouth and consequently more likely to have undergone environmental changes.

The specificity of the immunity reactions has been very striking and, from the practical point of view of specific therapy, is of great importance. A large amount of work has been devoted to study of the agglutination reactions of pneumococcus. Kindborg[2] has found that satisfactory agglutination occurs practically only when homologous serums are used. On the other hand, Hiss[3] has obtained a wide degree of cross-agglutination. Such contradictory results may largely depend on the investigator's luck in securing suitable organisms. If the collection should consist of a majority of members of one of the fixed groups, cross-agglutination would be the rule, whereas if the heterogeneous strains should predominate, a high degree of individual specificity would be observed. The fact that cross-protection does not occur except among members of individual groups of the fixed races has an important practical bearing. If polyvalent serums are to be used in the therapy of lobar pneumonia, such serums must be derived from representative members of the typical groups, if the therapeutic application is to be successful. On the other hand, if one uses univalent serums, representing each of the fixed races, a diagnosis of the type of organism concerned in individual instances of the disease must be made. The latter method is quite practicable and has been successfully employed at the Hospital of the Rockefeller Institute during the past year. Whether or not the results obtained from this study of pneumococci can be profitably applied to other pathogenic bacteria cannot be definitely asserted. It is not, however, illogical to assume that such a classification of other infectious organisms could be made. If this is true, in order that specific bacterial and serum therapy may be intelligently applied, such a study becomes imperative.

TABLE 3.—CROSS-PROTECTION WITH STRAINS OF HETEROGENEOUS GROUP

Amount of Culture, c.c.	Amount of Serum, c.c.	Different Strains and Results								
		Homologous Pn 71	Type Gr. 1 Pn 1	Type Gr. 2 Pn 6	Pn 36	Pn 37	Pn 32	Pn 55	Pn 60	Pn 76
0.01	0.2		D 20†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†
0.001	0.2	*	D 36†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†
0.0001	0.2	*	D 36†	D 36†	D 18†	D 18†	D 36†	D 20†	D 18†	D 18†
0.00001	0.2	*	D 36†	D 24†	D 18†	D 18†	D 36†	D 24†	D 18†	D 20†
0.001	—	D 18†	—	—	D 18†	D 18†	D 20†	D 18†	D 20†	D 24†
0.0001	—	D 18†	D 36†	D 24†	*	D 20†	*	D 20†	D 18†	*
0.00001	—	D 3.5‡	D 36†	D 36†	D 5‡	D 36†	D 3‡	D 36†	D 36†	D 3‡

*Survived. †Hours. ‡Days.

TABLE 4.—STRAINS TESTED AND RESULTS OF AGGLUTINATION

Sera	Pn 1	Pn 2	Pn 34	Pn 36	Pn 37	Pn 38	Pn 52	Pn 55	Pn 60	Pn 62	Pn 71	Pn 76	Pn 82	102
Pn 1	+	0	0	0	±	0	0	0	0	0	0	0	0	0
Pn 2	0	+	0	0	0	0	0	0	0	0	0	0	0	0
Pn 36	0	0	0	+	0	0	0	0	0	0	0	0	—	0
Pn 37	0	0	0	0	+	0	0	0	0	0	0	0	0	0
Pn 55	0	0	0	0	0	0	0	0	+	0	0	0	—	0
Pn 71	0	0	0	0	0	0	0	0	0	0	+	0	—	0
Pn 76	0	0	0	0	0	0	0	0	0	0	0	+	0	0
Pn 87	0	0	0	0	0	0	±	0	0	0	0	0	+	0
Polyvalent Pn 37, 38, 57	0	0	0	0	0	+	0	+	0	+	0	0	—	0

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CAPPS, DAVIS, DOCHEZ AND GILLESPIE

DR. FRANK BILLINGS, Chicago: In chronic joint infection one must remember the blood-supply of the joints. It is distinct for the periarticular structures, for the synovial membrane

2. Kindborg: Diss. (Halle), Leipsic, 1905. Ref. Centralbl. f. Bakt., 1906, Part 1, xxxviii, 172.
3. Hiss: Jour. Exper. Med., 1905, vii, 547.

and for the medulla of the bones which enter into the joint. Blood infection may take place only through these three channels. That explains why infection may at one time be periarticular or synovial, and at another osteoarthritic, or why all three types of infection may be present in a joint at the same time. I believe that many of the chronic joint diseases are infectious; even in some of the senile joint troubles infection may be a coincidence. The word senile must include the atrophic degenerations of the joints which at times occur in relatively young individuals. The morbid anatomy of chronic joint infections may be so nearly alike for various bacteria that the pathologist cannot differentiate them. The clinician may, however, group these different forms of infectious joint trouble because of rather characteristic clinical phenomena. For instance, a streptococcus infection may not only produce a periarthritis or synovitis or osteo-arthritis or changes in all three structures of a joint, but may also produce a chronic myositis. In probably every chronic streptococcus joint infection there is a myositis present in some part of the patient's body. Usually this is selective and involves the biceps humeri, the masseter, the erector spinae, the hamstring, the quadriceps femoris and the anterior tibial group of muscles. I do not mean that all of these different groups of muscles are involved in any one patient, but some of them may be. In addition, the patient who has been ill for a considerable period will show alteration in the general nutrition and metabolism, as evinced by an overgrowth of hair on the extremities, a change in the nutrition of the nails and often an evidence of atrophy of the skin itself. In all probability these malnutritional metabolic changes are the result of the long illness, but may be secondarily due to the infective agent. The streptococcus group can therefore be set aside clinically because of the attendant chronic myositis. The gonococcus chronic joint infections may have a morbid anatomy so like that of the streptococcus that one cannot differentiate, but clinically I have never seen a myositis in gonorrheal arthritis; there is frequently present, however, a tenosynovitis, and tenosynovitis I have never seen in streptococcus chronic arthritis. In the treatment one must first locate and remove the chronic focus of infection. This must be done thoroughly. Following this the patient must have a long period of rest, and this time of rest must, of course, be individual. The patient must have good, wholesome food to improve the general nutrition. To improve the immunity of the patient, in addition to the measures already described, one may use autogenous vaccination, which is of secondary importance as compared with the rest treatment and attention to the general nutrition of the patient. If autogenous vaccination is used it is possible that some benefit may result, if a bacteriologic diagnosis has been made in advance, from the use of commercial stock vaccines chosen on the basis of the bacterial diagnosis. Stock vaccine chosen on any other basis is a haphazard method of treatment.

On these principles I have managed patients with chronic arthritis with unusually good results, amounting to recovery in cases in which the joint changes have not gone on to a destructive stage and in severe types to improvement of the patient by bringing to a stop the progress of the disease.

DR. G. L. RICHARDS, Fall River, Mass.: In the last few years many patients have been referred to us on account of rheumatism. I should like to know whether Dr. Davis advises the removal of the tonsil whenever the diagnosis of rheumatism is made, or would he depend on the determination of streptococci in the tonsil? I refer especially to the small tonsil in which, if you draw the anterior pillar back, you may find a little tonsillar secretion or partially coagulated secretion or pus. Should we have a culture made from the surface of that tonsil before we take up the question of operation?

Dr. Davis spoke of cases in which the tonsillotome was not used because of the blood-pressure. What is the limit of blood-pressure which would contra-indicate operation?

After the operation of tonsillectomy there is a certain refilling of the spaces between the anterior and posterior pillars, and the laryngeal follicles at the base of the tongue may enlarge a little. Is there not some tendency of the infection to occur again, or is the danger from rheumatism over after the removal of the tonsil?

Although tonsil operating is being done rather indiscriminately throughout the United States at present, operations on the tonsil require just as much care as any other type of operation and should be attempted only by those who possess the proper qualifications.

DR. HENRY ALBERT, Iowa City, Iowa: I should like to ask Dr. Capps in what proportion of the cases of epidemic sore throat of milk origin there was tonsillitis and in what proportion pharyngitis. I presume it is almost always a follicular tonsillitis. During the past year I performed some experiments which, I believe, might be applicable in the treatment of the cases of tonsillitis accompanied by rheumatism. With the idea of treating diphtheria carriers I aimed not only at disinfecting the crypts of the tonsils, but also at producing a reaction. This was done by the use of silver nitrate. I used solutions of different strength (from 5 to 40 per cent.) applied to the tonsillar crypts, five minutes, fifteen minutes, one day, two days and seven days before the removal of the tonsils. I found that, if a solution stronger than 10 per cent. was well applied to the crypts, the entire epithelial layer would be destroyed. In almost any strength there was considerable inflammatory reaction. The experiments were not continued long enough in any case to show whether or not there was any occlusion of the crypts. The immediate effect of the silver nitrate is a destruction of the epithelial lining of the crypts. I hoped that, before the cells could regenerate, there would be sufficient proliferation of the fibroblasts to lead to occlusion of the crypts of the tonsils. At any rate, so far as the diphtheria-carrier condition was concerned, this treatment had good effect, and I do not see any reason why that would not be a good procedure when the removal of the tonsil is objected to, especially in view of the fact that the removal of those tissues sometimes causes an exacerbation of the joint lesions.

DR. NORMAN BRIDGE, Los Angeles: I should like to say a word from the point of view of the practicing physician. These investigations are among the most valuable that have been made. They are interesting because physicians cannot entirely agree on some of the questions, for instance, the character of the micro-organism. That makes for progress and is unavoidable in the development of the science of bacteriology. The lesson to the practicing physician, however, is one of the most momentous of all. It seems to me that we are coming to the point of believing that a large percentage of the cases of acute rheumatism originate in the tonsil, whatever the character of the microorganism may be. There is a considerable proportion of young persons, more young than old, who acquire acute rheumatism and endocarditis with leaky valves, and live on through life more or less crippled as a consequence. It seems to have been proved that removing the tonsils does no harm. Removing them, moreover, completely abolishes one source of infection. It seems as though we were coming to the point of finding it a duty to advise the removal of the tonsils as a regular and standard measure for the protection of the young. I do not know that I would advise that to-day, but this will be the practice in the future, judging by the proofs that are being accumulated through the labors of students of biology. I am positive that the tonsils should not be removed by the man who is simply capable of using a tonsillotome, and they should never be removed by the old-fashioned tonsillotome; they should be enucleated completely by the most modern method by those familiar with this operation. I am anxious to hear whether or not there is any definite scientific objection to advising parents that it would protect the lives of their children, at least protect against possible rheumatism and chronic arthritis, if the tonsils were removed.

DR. LOUIS F. JERMAIN, Milwaukee, Wis.: Considerable stress has been laid on the importance of the tonsil as a portal of entry for invading micro-organisms to joint structures. Attention has also been directed to sinus disease and other possible foci. In this connection, we must not forget suppurative processes in the mouth and especially of

the teeth and gums. I believe that the primary focus is often in the teeth and gums, and the infection spreads from there to the tonsils or may invade the body directly. In my own case I am certain that a bacterial invasion occurred in this manner, namely, primarily in the gums, thence to the tonsils and subsequently to joints. What I wish to emphasize is, that we should not be content with a removal of the tonsils, but should endeavor to eliminate all possible foci of invasion.

DR. J. A. CAPPS, Chicago: In reply to Dr. Albert's question I would say that in most of the cases in all these epidemics a redness of the throat is described which is diffuse, spreading over both the pharynx and the tonsils, so that one can say there is both pharyngitis and tonsillitis. In some cases there is an exudate thick enough and extensive enough to resemble a diphtheritic membrane.

DR. D. J. DAVIS, Chicago: In answer to the question of Dr. Richards concerning the extirpation of the tonsils, I would say that this is not always an easy matter to decide. In chronic arthritis the tonsils are at fault in most cases. Our attention is therefore directed first to a careful examination of these organs. Other foci may also be present. For example, alveolar abscesses are not infrequent. They frequently occur with infected tonsils. Either one or possibly both may be at fault; or one may depend on the other. There may be still other foci. This all means that we must subject the entire body to a most careful physical examination. If the tonsils are diseased they should be treated. If the teeth are diseased they should be treated. I think that one can often, but not always, detect these tonsillar infections from the appearance of the tonsils. But sometimes the tonsils are smaller than normal. At times also by a careful examination one can find little pockets of pus in tonsils that look quite normal on the surface.

There will perhaps be cases now and then in which no focus can be found. Under these conditions I think one is justified in enucleating the tonsils with the hope that this operation may do good. The bacteriologic examination should be correlated with the other findings. It ought to be quite unnecessary to say that in every instance complete enucleation should be carried out. In four of the cases referred to the tonsils had been removed previously; that is, the top of the tonsil had been sliced off. This operation did absolutely no good. There were recurrences and I am inclined to believe that this operation is actually dangerous, because it causes the fibrous tissue to form about the openings of the crypts preventing proper drainage.

The case of high blood-pressure that I mentioned occurred in a man, about 60 years old, suffering with chronic arthritis. The blood-pressure ranged from 190 to 210 and as he had had some experience with hemorrhage, it was thought unwise to operate on the tonsil. The crypts were opened and pus was obtained. It was clear that they were infected and vaccination and treatment of the tonsil resulted in a striking recovery. I have not made any bacteriologic examination of the lymphoid tissue of the pharynx.

THE TEACHING OF LABORATORY PHYSIOLOGY

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At a time when there is growing complaint about the overcrowding of the medical curriculum, resentment among undergraduates at the waste of time in conducting apparently fruitless experiments, and caustic criticism among graduates aimed at the teaching of isolated facts of undemonstrable utility, it may not be amiss to examine some of the conditions toward which adverse comment is directed. Possibly the irritation felt has a justification; possibly the curriculum might be lightened and improved by clearing away the relatively unessential and placing more emphasis on data of unquestioned adaptability. That such a clarifying investigation might be profitably conducted in nearly every branch of medical teaching seems to be generally believed by the practicing profession. The present discussion, however, must be limited in subject-matter principally to laboratory physiology.

As a brief preliminary, it should be accepted as axiomatic that the matriculant in medicine is thereby a self-limited specialist. He has chosen to concentrate his energies in acquiring the difficult art of preventing as well as curing the varied ills to which human flesh seems heir. He seeks specific knowledge, not desultory information; purposive data, not cursory generalities. To assist him in realizing his laudable ambition, great stress should be laid on such facts as have well-defined utilizable value in the practice of medicine and surgery. Such facts as have but a remote relationship to the practice of medicine may well have their consideration deferred until the more important subjects have been disposed of. So it is, when the medical student enters the laboratory of physiology, he comes seeking experimental demonstrations concerning the functioning of all the structures of the human body, the architecture of which he has been studying in the laboratory of anatomy. He does not seek, as he does not need at this time, information concerning the reactions of *Rotifera*, *Coelenterata* or *Batrachia*. General biology and zoology belong to the academic side of the university and should there be considered, if at all, in a course preliminary to the medical. Likewise, comparative physiology —an intensely interesting subject—should not be allowed to usurp time vitally needed for consideration of the far more important subject of human physiology. That time spent on experiments in general biology constitutes a usurpation is shown by the fact that no medical school, so far as can be learned, has sufficient time in its course in laboratory physiology to do even scant justice to some divisions of the subject; notably, physiology of the brain. Yet, I submit, it is infinitely more important that a student learn those fundamental tests of normality whereby he may be enabled to save a handicapped child from condemnation to relative idiocy than it is that he should be conversant with the graphic record of heart-block in *Rana esculenta*.

A depressing amount of time is spent in worrying about the elasticity, contractility and spasticity of the frog's gastrocnemius, in entire forgetfulness of the fact that many of the so-called classic experiments are now of historical interest only. It is not to be denied that many of the routine experiments were of much value as original investigations; but such value fails to reappear when the experiment is repeated in the laboratory of human physiology, inasmuch as its original purpose is neglected, and, moreover, it is not demanded by present circumstances. The function of the department of physiology in a medical school is to give students a vivid acquaintance with the varied activities of the normal human body; it is not its function to fritter away the time of embryonic expert clinicians by making haphazard, elementary drives at abstruse research. If there be discovered, occasionally, a student possessing the qualifications peculiar for research, he may easily be singled out and given such problems as his time and ability permit. To the average student, however, it is an injustice to require him to use his time performing experiments of inconsiderable value. Moreover, to quote Thorndike.[1]

1. Thorndike: Education, p. 178

It is not safe to disregard what is taught, so long as it is taught as an exercise in scientific method. A laboratory should teach facts important in themselves. It is disastrous to scientific habits in the young for them to find repeatedly that elaborate experimental work brings at the end some trivial or meaningless result.

That the results of a large number of laboratory experiments (especially of the nerve-muscle type) are relatively trivial seems undebatable. For example: of what value to a student of medicine is the experiment of extirpation of a frog's cerebrum? No one seriously contends that the resulting phenomena dependably illustrate any phase in medicine. And though it is conceivable that a human anencephalus might live for some time and manifest the various reactions of vegetative existence, yet no important surgical deductions therefrom seem possible. To the neuropathologist such a condition might prove of great value; but the majority of men can better await the results of the pathologist's prolonged investigations than waste otherwise valuable time in not sticking to their lasts.

It might be gently suggested by some exponent of customary laboratory methods that some criterions of value should first be presented, lest my discussion seem tangential. Such criteria have been submitted by Thorndike,[2] as follows: (a) "Knowledge is of value in proportion to the number of situations to which it applies"; (b) "Knowledge is of value in proportion to the importance to human welfare of the situations to which it applies." Now, since the principal aim of medical physiology is to develop the student's skill in understanding the normal functions of the body, it would certainly seem that a far greater number of applicable situations could be found by minutely investigating a fellow-student's body instead of that of a frog; and that the importance of these situations to human welfare would be proportionally commensurate.

It may be urged, however, that experimental work on frogs, cats and guinea-pigs has a value as "formal training"; that it inculcates the scientific method of procedure, and that it develops in the student those habits of analysis and synthesis so essential to the practitioner. In rebuttal it must be contended that those who urge this claim should be able to demonstrate it by actual experimentation. Such demonstrations have not been presented, either in literature or in the mature opinions of quondam pupils. On the contrary, an increasing amount of literature by such investigators as Scripture, Thorndike and O'Shea leads one to believe that "formal training" is a myth; that training in one line helps very little in any other; and that success in analyzing a situation depends on previous experience in situations having identical factors. The mind in its reactions on its environments can acquire the power of apprehension only by dealing directly with the phenomena to be analyzed.

Thorndike says:[3]

The working of every mental function-group is conditioned by the nature of the data in each particular case.

And again:[4]

A change in one function alters any other in so far as the two functions have as factors identical elements.

Says O'Shea:[5]

The power of analyzing depends primarily on experience, and conforms to the principle of apperception. The ornithologist discerns the essential characteristics of birds in order that he may classify them. The farmer discerns just the characteristics in his corn and potatoes which indicate when he should cultivate them. The physician discerns just the manifestations of disease which indicate what the difficulty is. And in all these instances the ability to pick out the essential thing is dependent on large experience in which just the essential things have been frequently observed and appreciated.

These quotations from men who have based their conclusions on extensive research-work, in experimental psychology, indicate how slight must be the value of so-called "formal training"; indicate that the scientific method of procedure is best learned by repetitions in immediately adaptable situations; and that the ability of analyzing an erring function is most surely acquired by first becoming extremely familiar with that function in its normal condition and environment.

These contentions may be further sustained by a consideration of mental phenomena. Let us regard simple memory as a resultant of modifications of cortical cells, such changes being due to external stimuli immediate or remote; and let us consider that memory is conditioned by the number and persistence of association-tracts whereby a given cell is linked up with others. Analysis and synthesis in ratiocination are likewise dependent on the number and persistence of association-tracts. The number and correlativeness of these tracts depend largely on the learning method whereby new facts are associated more or less intimately with facts that were previously known. The persistence of these tracts, or, rather, the ease with which neural discharges pass along association-tracts, is determined by the frequency or intensity of those discharges. Or, in other words, the more frequently, discriminatingly and concentratedly one thinks about given data, the more firmly lodged in memory those data become. It is inevitable that those facts will be most thought of, and will have the greatest number of possible associations, which also are most intimately correlated with possibilities of application. These possibilities are necessarily far more numerously derived from a study of the functioning human body and of illustrating models than from the hearts and muscles of frogs. Moreover, the student's brain is apt to develop, in his study of frogs, a nervous mechanism fashioned through and for the study of nerve-muscle reactions, a mechanism constructed largely for the sole purpose of passing an examination in relative non-essentials. Waiving the question whether or no this nervous mechanism, devoted to "frogology," may later become parasitic on the general neural vitality, it may still be justly urged that a far better utilization of the time could be made in the study of such reactions of the normal human body as may be utilized later in determining departures from the normal.

Lying before me on my desk are several laboratory manuals of physiology. An examination of the one most recently issued (Hemmeter, 1912) discloses some interesting data. Of the 216 pages, nearly one-half (41.6 per cent.) is devoted to experiments on frogs, and to extensive descriptions of necessary apparatus. If the same emphasis were carried out in instruction, this would mean that in a college course of thirty-six weeks a student must spend sixteen physiology weeks in the well-nigh profitless (to the student of medicine) course of "frogology." The word "profitless" is used advisedly, as I feel very strongly that in most of these experiments there is very little demonstrable utility for the student

2. Thorndike: Education, p. 129.
3. Thorndike: Educational Psychology, chap. viii, p. 80.
4. Thorndike: Educational Psychology, p. 80.
5. O'Shea: Education as Adjustment, p. 235.

of medicine. It behooves those who believe otherwise to justify their course, not by *a priori* assertions of imagined value, but by *post facto* demonstrations in experimental psychology. Recurring again to the manual, it was found to contain thirty-four pages, or 15.6 per cent., devoted to experiments in human physiology; one page on blood enumeration, nine on blood-pressure, one on respiration, one on the nervous system, five on vision, nine on physiologic chemistry, and three on electric conduction! These strictures, it must be understood, are not directed against the author, for whom I have all due respect; nor against the manual *per se*, which has much value as a reference book; but against that state of mind in education that confuses high specialization with general utility. The only specialization permissible in the curriculum of a medical school should be that of studied adaptation of all the exercises to the future needs of the physician and surgeon. "General culture and information" should come before the medical course or be deferred until later in life, as every hour of the present four-year course is needed for just the acquisition of those essentials pertinent to a correct diagnosis and treatment of diseases and their causes.

A similar criticism may be directed at Porter's "Introduction to Physiology" (1906), which has over 47 per cent. of its pages devoted to experiments on frogs, chiefly nerve-muscle preparations. Cannon's "Laboratory Course in Physiology" (1910) shows a gratifying decrease to about 27 per cent. of frog-work, and a very welcome extension into experiments of applicable value.

Aside from these unprofitable "nerve-muscle" experiments, and related animal experiments of similar irrelevance, all of which help to crowd the curriculum and irritate and distract the student, there remains, also to the student's disadvantage, a remarkable hiatus, Where are the experiments used to determine the functions of the brain—perception, cognition, association, memory, reasoning, judgment? Where are the tests for normality and departures? Are not these functions physiologic? Are they not experimentally demonstrable? Then, why are they not considered in the laboratory? Is it not more important that the student be able to recognize reaction-differences between the normal child and the deviate than to know how to tie a Stannius ligature? How understand retardation, deficiency, degeneracy, aberrancy and criminality except by being expert in determining the relatively normal? And where better can the principles and methods of such determination be acquired than in the laboratory of experimental psychology? and where else may be gained facility in applying this knowledge but in the psychologic clinic? If the resources of the medical school do not permit of a department of analytical and clinical psychology, then the department of physiology should be so rearranged as to allow of as much time for the consideration of the physiology of the brain as is proportionate to its importance.

Deficiency of psychologic knowledge in physicians has been in part responsible for the development of several religious and religio-scientific cults of healing. These various cults have taken several dimly understood mental laws and welded them with superstition and mysticism, to the further detriment of intellectual advancement by the laity. It is, therefore, more incumbent on every physician to become well-grounded in all the known laws of medical psychology, not alone, however, that he may combat intellectual error, but also that in his social relations he may be able to recognize and treat rightly the fundamental causes of mental and moral retardation. It will be noted that this field is not one occupied by the alienist or psychiatrist; but is a field to be investigated by every physician, especially by him who is a public school examiner. Several large cities now regularly employ for their schools expert psychologists, a position which would presumably be better filled by a man who had had the additional training of a course in medicine.

The urgent necessity for such training for our physicians may best be illustrated by a concrete instance.[6]

> In March, 1908, there came under the care of the Children's Aid Society of Pennsylvania an 11-year-old child of vague parentage and dubious heritage. The authorities of the county poorhouse had turned her over to the society because of her "persistent and excessive incorrigibility." She "had not yet taken the initial steps in school-work and was considered to be mentally deficient as well as morally defective." She was placed first in a hospital for treatment for keratitis, but became so mischievous, "even malicious," as to require removal. While temporarily in a boarding-house, she was reported to be "uncontrollable, even dangerous." She had a low, somewhat bulging forehead; the bridge of her nose was slightly depressed; the eyes were kept narrow and slit-like, and the lower lid protruded with an air of sullen stubbornness. She had the appearance of a mental and moral degenerate. Probably the majority of physicians and probation judges, relying on her history and physical appearance, would have pronounced her a degenerate, and ordered her off to a parental school, a reform school, or a home for the feeble-minded. A few simple tests, however, sagaciously applied at the psychologic clinic of the University of Pennsylvania, quickly proved that this child was not a degenerate but a retardant. She had had no capable person to educate and train her; and, because of an ozena, no one to be sympathetic and loving to her. But, with the encouraging prognosis of a competent psychologist for stimulation, Miss Campion, the agent of the Children's Aid Society, entered on a work of redemption. Two years of loving oversight, of needed medical and surgical attention, and of unremitting patient application of enlightened, pedagogic principles have wrought the following results, as given in the latest report: "Mary is in the second grade, class A, of a Philadelphia public school. She is neither troublesome nor incorrigible. She is never vicious, is extremely imaginative and demonstrative, honest and truthful, fairly obedient, and very loyal to those who are kind to her. She is orderly about her clothes, bathes regularly and willingly. She has fair reasoning power, and uses it. She is undoubtedly clean-minded, has never used improper language, and seems to be wholly innocent of ideas of sex. At home Mary is interested, willing and considerate. She helps with household tasks and takes great interest in the home-life around her." As Miss Campion says: "Mary, as she is to-day, with her improved vision and happy interested face, and with her extreme gratitude to all who have helped her, is an inspiration to anyone interested in child-helping work."

What would have been Mary's fate had she been left to the diagnostic mercy of the average physician? Judging by the reports of competent investigators, her fate would have been commitment to some institution until she reached her majority; then release, a degenerate then in fact, to be a radiating point of crime and imbecility. And in place of training our young physicians to recognize the possibilities in these Marys, thereby protecting both girls and society, we are wasting both students' and teachers' time in such fruitless experiments as Stannius ligatures and Gaskell's clamps!

Ninety-eight per cent. of the customary frog-work could well be thrown out; also, the greater part of the

6. Witmer: The Irrepressible Ego, Psychological Clinic, December, 1910, iv, 192.

experiments conducted on animals. For all the frog muscle-nerve experiments having any possible medical significance, it is perfectly feasible to substitute related experiments on living human subjects. Who will deny that, for medical students, such substitution would greatly augment the value of the experiments? The data obtainable by animal experimentation in the research laboratory can be far more scientifically imparted by a few moments' intelligent discussion, or demonstration, than by several hours of crude attempts by amateurs at the same experiment. It is, moreover, as uneconomical as it is unscientific to spend two hours in learning by instrumental manipulation what could be more thoroughly comprehended by five minutes of concentrated thinking. Circulation experiments by vivisection provoke some curiosity and wonder, when similar demonstrations with mechanical models stimulate imagination, reason and judgment. There seems no limit to the illustrative devices possible to scientific ingenuity, automatons imitative of practically every bodily movement and function being readily contrivable; and such models, because of their simplicity and definiteness, are much more richly illustrative than anything a student can ordinarily obtain from the anesthetized cat, dog or guinea-pig.

A few searching questions asked of the average practitioner quickly show that there is considerable need for experimental work so arranged as to illuminate the actions of muscle-groups as well as of individual muscles; and this work might well be preceded by a carefully selected series of experiments dealing with the physiology and mechanics of bones and joints. For experiments in circulation and respiration no animal experiments (capillary circulation excepted) can compare in value with the data obtainable from examinations of fellow-students, and from manipulating mechanical models. Experiments in digestion and absorption have been largely transferred to a separate department of chemistry. The special senses could well receive much more attention than the customary allotment, while the brain, with its activities as manifested in emotional and intellectual states, should be given extensive attention in laboratory investigation. No division in physiology is more important; no section is more neglected. Even "standard" text-books on physiology devote their consideration of the central nervous system to a discussion of anatomy and somatic reflexes. And, as Loeb well says:[7]

> We can no more expect to unravel the mechanism of associative memory by . . . morphologic methods than we can expect to unravel the dynamics of electrical phenomena by . . . counting and locating the telephone connections in a big city.

Very little brain physiology as expressed in mental states is discoverable in any text-book. Yet such states exert a tremendous influence on all with which the physician has to deal. Therefore both their conditions and revelations need and deserve careful, serious consideration. True, such a course constitutes physiologic psychology; but who needs such a course more than the physician? Certainly society needs to have every physician trained in such a course.

Let us clear away our pedagogic cobwebs. Let us throw out from our medical curriculum everything not demonstrably applicable and, in its place, let us give a course of applied science throughout. So may our burdened curriculum be lightened, our students held with intense interest, our graduates strengthened to grapple more adequately with their problems, and society cheered and comforted.

7. Loeb: Physiology of the Brain, 1902, p. 289.

SUMMARY

I can do no better, in closing, than to quote the following pregnant words from O'Shea:

> "In every machine there are economical as well as wasteful methods of operation, and the same must be true in principle of the brain. A given amount of force can accomplish more in promoting activities in well-organized than in poorly-organized areas."[8] Hence "an individual should be required to perform during his learning-period those activities which he will be called on to perform most often in maturity. He must be practiced in doing as an apprentice what he will have to do as an artisan."[9]

433 Main Street.

A STUDY OF THE SPINAL FLUID IN ONE HUNDRED CASES OF SYPHILIS

INCLUDING INVESTIGATIONS FOR ARSENIC AFTER INTRAVENOUS ADMINISTRATION OF NEOSALVARSAN *

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Examination of the spinal fluid has in recent years become of great value in the study of syphilis of the nervous system, particularly in the so-called parasyphilitic conditions, tabes and paresis, which we now know, through the investigations of Noguchi and others, to be not parasyphilitic but due to the invasion of the cerebrospinal system by the *Spirochaeta pallida* itself.

We undertook the investigation of the cerebrospinal fluid on account of the definite findings that can be demonstrated in it to indicate an invasion of the cerebrospinal system by the *Spirochaeta pallida*, the purpose being to determine what percentage of patients with syphilis applying for treatment at a general dermatologic clinic would show evidence of spinal invasion.

The large percentage of early syphilis reported in literature as giving evidence of meningeal disturbance encouraged us. All of the cases of syphilis, therefore, in the outpatient department of the Washington University Hospital and the Barnard Free Skin and Cancer Hospital, if the patient would submit to spinal puncture, were studied.

All of the cases in the investigation were examined in the following manner: Blood and spinal fluid were obtained simultaneously and a Wassermann reaction made on the two fluids, two separate antigens being used with increasing amounts of spinal fluid, beginning with 0.2 c.c. and increasing to 0.5 c.c. The cells in the spinal fluid were counted from undiluted fluid in the ordinary blood-counting chamber. The globulin reaction was determined by the Noguchi method. Fehling's reduction test was also performed on each fluid, as normal spinal fluid reduces Fehling's solution, owing supposedly to the presence of pyro-

8. O'Shea: Education as Adjustment, p. 264.
9. O'Shea: Education as Adjustment, p. 265.

* From the Medical Department of Washington University and the Barnard Skin and Cancer Hospital.
* Read in the Section on Dermatology of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.
* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints.

catechin. This reaction is sometimes absent, however, in inflammatory conditions.

One of the earliest investigators of the spinal fluid in syphilitics is Ravaut[1] who, in 1903, affirmed that a large number of syphilitics at all periods of the disease presented a lymphocytosis in the spinal fluid which was indicative of meningeal disturbance, and in 1907 showed that a large percentage of syphilitic children showed spinal involvement. The majority of the latter presented mucous membrane and cutaneous lesions also. Ravaut[2] again affirmed, in 1912, that at the time of the chancre there was no involvement of the nervous system, but that 67 per cent. of the syphilitics showing no clinical nervous symptoms had a meningeal infection, evidenced by lymphocytosis and albumin content in the spinal fluid. He believed from this that if, in the secondary period, such a positive reaction should be present, the administration of salvarsan was dangerous, as the spirochete fixed the arsenic and caused a neurotropic reaction.

Jeanselme and Chevallier[3] state that the spinal fluid is negative in the chancre stage and positive in a large majority of cases in the so-called secondary period of the invasion, but that only a small percentage show involvement of the cerebrospinal system through the study of the spinal fluid in late syphilis. From their investigations these two writers affirm that there may be no clinical symptoms of meningeal involvement, with considerable cytologic evidence, or that such an involvement may cause severe headache which is relieved by lumbar puncture. They also state that syphilitics in the so-called secondary period with no eruption may show marked lymphocytosis in the fluid. From the reported findings of these investigators and others, the general opinion has been that a large percentage of early cases of syphilis show invasion of the cerebrospinal system and the prognosis depends only on a proper study of the spinal fluid. We were under this impression when we undertook the work, but have been surprised at our results, as they differ so materially from those of others.

Previous to spinal puncture, a complete physical examination of each patient was made; namely, of the viscera, fundus of the eye, pupillary and the various other reflexes, and for other symptoms of central nerve involvement. As headache is frequently a prominent early symptom of cerebral lues, careful note of this was made in each case. In all cases in which it was possible, more than one puncture was made and after each a maximum dose of neosalvarsan was administered intravenously. In four cases, after the intravenous injection of neosalvarsan a search was made for arsenic in the spinal fluid, details of which we shall give later.

REPORT OF CASES

Case 1.—P. C.[4] Congenital lues. Viscera, heart and reflexes normal. Iritis of both eyes. Nov. 19, 1912: Wassermann, serum ++++, spinal fluid ++++; cell-count 54, globulin +, reduction ±. Treatment, neosalvarsan and mercury. Puncture normal; fluid clear.

Case 5.—History 3575, B. F. S. and C. H. No history of lues obtainable. Hemiplegia of entire left side; mental aberration, exaggerated reflexes, ankle-clonus. Aug. 17, 1912: Wassermann, serum ++++, spinal fluid ++++; cell-count 60, globulin +, reduction ±. Puncture, increased pressure; fluid clear. Treatment, salvarsan and mercury. Nov. 9, 1912: Wassermann, serum ++++, spinal fluid ++++; globulin +, cell-count 25, reduction +. Puncture normal, fluid clear.

Case 7.—History 4212, B. F. S. and C. H. No history of infection. Early symptoms of tabes. Heart, eyes and viscera normal. Knee-reflexes sluggish. Oct. 30, 1912: Wassermann, serum +, spinal fluid ++; cell-count 20, globulin +, reduction —. Puncture normal, fluid clear.

Case 8.—History 4282, B. F. S. and C. H. History indefinite. Late lues. Circinate ulceration of left arm. Viscera, heart, eyes and reflexes normal. Nov. 22, 1912: Wassermann, serum ++++, spinal fluid ++++; cell-count 25, globulin +, reduction ±. Puncture, increased pressure; fluid clear.

Case 9.—History 4179, B. F. S. and C. H. Infection one year ago. No lesions at present. Viscera, heart, eyes and reflexes normal. Oct. 12, 1912: Wassermann, serum ++++, spinal fluid ++++; globulin +, cell-count 30, reduction ±. Puncture normal, fluid clear.

Case 17.—History 4544, B. F. S. and C. H. Infection two months ago. No lesions at present. Viscera, heart and eyes normal, reflexes sluggish. March 6, 1913: Wassermann, serum ++++, spinal fluid —; cell-count 17, globulin —, reduction +. Puncture, slight increase in pressure; fluid clear. Treatment, neosalvarsan.

Case 20, Sanatorium.—No history of infection. At present paresis. Patient confined in sanatorium. Pupils irregular; reaction sluggish; knee and Achilles reflexes absent. Viscera and heart normal. April 22, 1913: Wassermann, serum ++++, spinal fluid ++++; globulin +, cell-count 112, reduction ±. Puncture, increased pressure; fluid clear. April 22, 1913: Treatment, neosalvarsan 0.9 gm. intravenously. April 27, 1913: Puncture; spinal fluid examined for the presence of arsenic with negative result.

Case 21, Sanatorium.—Date of infection not obtainable. Patient confined in sanatorium with paresis. Romberg's symptom present; pupils equal, reaction good. Knee and Achilles reflexes absent. Viscera and heart normal. April 22, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 32, globulin +, reduction +. Puncture, increased pressure; fluid clear. April 22, 1913: Treatment, neosalvarsan 0.9 gm. intravenously. April 27, 1913: Puncture; spinal fluid examined for the presence of arsenic with negative result.

Case 22, Sanatorium.—Infection fifteen years ago. No history of treatment obtainable. Patient confined in sanatorium with paresis. Pupils irregular; reaction sluggish. Achilles and knee-reflexes absent. April 22, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 42, globulin +, reduction ±. Puncture, pressure normal; fluid clear. Treatment, neosalvarsan 0.9 gm. intravenously. April 24, 1913: Puncture; spinal fluid examined for the presence of arsenic with negative result.

Case 23, Sanatorium.—Date of infection not obtainable. Patient confined in sanatorium with paresis. Romberg's symptom present; pupils irregular; reaction sluggish. Reflexes: Knee sluggish, Achilles absent. Viscera and heart normal. April 22, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 62, globulin +, reduction —. Puncture, pressure increased; fluid clear. Treatment, neosalvarsan 0.9 gm. intravenously. April 24, 1913: Puncture; spinal fluid examined for the presence of arsenic with negative result.

Case 35.—History 1545, B. F. S. and C. H. Infection fourteen years ago. Late lues; tuberculous ulcer of lower lip. Viscera, heart and eyes normal. Knee-reflexes sluggish. April 11, 1913. Wassermann, serum ++++. Treatment, neosalvarsan. April 21, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 27, globulin +, reduction ±. Puncture, pressure increased, fluid clear.

Case 36.—History 4051, B. F. S. and C. H. Infection eight months ago. Viscera, heart and eyes normal. Reflexes, knee and Achilles, sluggish. March 12, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 42, globulin +, reduction ±. Puncture, pressure increased, fluid clear. Treatment, neosalvarsan and mercury. March 26, 1913: Wassermann, serum ++++.

1. Ravaut: Ann. de dermat. et de syph., 1903, p. 537.
2. Ravaut: Ann. de dermat. et de syph., 1907, p. 81.
3. Jeanselme and Chevallier: Ann. de dermat. et de syph., 1912, p. 506.
4. In the case reports abbreviations indicate: W. U.=Washington University; B. F. S. and C. H.=Barnard Free Skin and Cancer Hospital; P. C. = private consultation.

CASE 39.—History 4339, B. F. S. and C. H. Infection two months ago. Macular secondaries. Viscera, heart, eyes and reflexes normal. Dec. 23, 1912: Wassermann, serum ++++, spinal fluid —; cell-count 12, globulin ±, reduction +. Puncture normal, fluid clear. Treatment, salvarsan.

CASE 42.—History 4375, B. F. S. and C. H. Infection five years ago. Healed scars on right forearm. Viscera, heart and eyes normal. Reflexes, knee and Achilles accentuated; ankle-clonus marked on both sides. Jan. 2, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 15, globulin +, reduction —. Puncture, increased pressure; fluid clear. Treatment, neosalvarsan and mercury.

CASE 45.—History 4571, B. F. S. and C. H. Infection two months ago. Large crusted primary on lower lip; submental adenopathy. Viscera, heart, eyes and reflexes normal. March 14, 1913: Wassermann, serum ++++, spinal fluid —; cell-count 12, globulin —, reduction +. Puncture normal, fluid clear. Treatment, neosalvarsan.

CASE 48.—Blood positive; spinal fluid negative. History 4586, B. F. S. and C. H. Infection thirteen weeks ago. Viscera, eyes and reflexes normal. Heart, second sound accentuated. March 27, 1913: Wassermann, serum ++++, spinal fluid —; cell-count 2, globulin —, reduction +. Puncture normal, fluid clear. Treatment, neosalvarsan.

CASE 49.—History 4574, B. F. S. and C. H. Infection four years ago. No lesions. Viscera, eyes and reflexes normal. Heart, systolic murmur at third intercostal space. March 27, 1913: Wassermann, serum +++, spinal fluid ++++; cell-count 107, globulin +, reduction ±. Puncture, increased pressure; fluid clear. Treatment, neosalvarsan.

CASE 56.—History 4282, B. F. S. and C. H. No history of infection. At present, circinate ulceration on left arm. Healed scars on both arms. Nov. 22, 1912: Viscera, heart and eyes normal. Knee-reflexes slightly accentuated. Wassermann, serum ++++, spinal fluid ++++; cell-count 25, globulin +, reduction ±. Puncture, increased pressure; fluid clear. Treatment, salvarsan.

CASE 67.—History 4391, B. F. S. and C. H. Infection seven years ago. No lesions. Viscera, heart, eyes and reflexes normal. Jan. 11, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 34, globulin +, reduction ±. Puncture normal, fluid clear. Treatment, salvarsan.

CASE 71.—History P. C. Infection eighteen years ago. Early tabes. Eyes, reaction sluggish. Reflexes, knee and Achilles, absent. Viscera and heart normal. Feb. 14, 1913: Wassermann, serum ++++, spinal fluid ++++; globulin +; cell-count 60, reduction —. Puncture, increased pressure; fluid clear.

CASE 72.—Blood positive; spinal fluid negative. History P. C. Infection eight months ago. No lesions. Viscera, heart, eyes and reflexes normal. Oct. 9, 1912: Wassermann, serum ++++, spinal fluid —; cell-count 8, globulin —, reduction +. Puncture normal, fluid clear. Treatment, neosalvarsan.

CASE 75.—History 363, W. U. No history of infection. No lesions. Progressive muscular atrophy. Reflexes accentuated. Nov. 11, 1912: Wassermann, serum —, spinal fluid ++++; cell-count 26, globulin +, reduction +. Puncture normal, fluid clear.

CASE 78.—History 334, W. U. Definite history of syphilis twenty years ago. No skin lesions. Physical examination; aneurysm of arch of aorta. Reflexes difficult to elicit. Oct. 30, 1912: Wassermann, serum —, spinal fluid —; cell-count 43, globulin +, reduction ±. Puncture normal, fluid clear.

CASE 79.—History 424, W. U. History of infection nine years ago. No skin lesions. Symptoms of chronic lead-poisoning. Nov. 4, 1912: Wassermann, serum ++++, spinal fluid ++++; cell-count 264, globulin +, reduction ±. Puncture normal, fluid clear.

CASE 81.—History 368, W. U. Infection ten years ago. No lesions. Viscera, heart, eyes and reflexes normal. Neck rigid. Tuberculosis of cervical vertebra. Ankylosis of right knee. Dec. 6, 1912: Wassermann, serum ++++, spinal fluid ++++; cell-count 32, globulin +, reduction +. Puncture normal, fluid clear.

CASE 84.—History 364, W. U. No history of infection. No skin lesions. Reflexes sluggish. Physical examination; aneurysm of ascending aorta. Aortic mitral regurgitation. Feb. 17, 1913: Wassermann, serum ++++, spinal fluid ++; cell-count 6, globulin —, reduction +. Puncture normal, fluid clear.

CASE 86.—History 497, W. U. Infection six years ago. No skin lesions. Heart, eyes and reflexes normal. Symptoms of duodenal ulcer. March 29, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 24, globulin ±, reduction +. Puncture normal, fluid clear.

CASE 87.—History 530, W. U. No history of infection. No skin lesions. Viscera, heart and eyes normal. Reflexes exaggerated. Symptoms of right hemiplegia. History of frequent miscarriages. May 9, 1913: Wassermann, serum ++++, spinal fluid ++++; cell-count 32, globulin +, reduction +. Puncture normal, fluid clear.

CASE 90.—History 542, W. U. No history of infection. No skin lesions. Reflexes sluggish. Optic atrophy of both eyes; pupils fixed, right larger than left. Dizziness and headache. Romberg's symptom. April 22, 1913: Wassermann, serum —, spinal fluid ++++; cell-count 32, globulin +, reduction +. Puncture normal, fluid clear.

CASE 91.—P. C. Infection two years ago. No skin lesions. Viscera, heart and reflexes normal. Slight headaches. Pupils irregular; right larger than left; reaction both to light and accommodation. April 28, 1913: Wassermann, serum +, spinal fluid +++; cell-count 18, globulin ±, reduction +. Puncture normal, fluid clear. Treatment, neosalvarsan and mercury.

CASE 96.—P. C. No history of infection. Mucous patches on mouth and tonsils; ulcer on uvula. Viscera, heart, eyes and reflexes normal. March 10, 1913: Wassermann, serum ++++, spinal fluid —; cell-count 16, globulin ±, reduction +. Puncture normal, fluid clear. Treatment, neosalvarsan.

CASE 99.—History 562, W. U. Infection nine years ago. No lesions. Clinical symptoms of gastric crisis. Pupils irregular, left larger than right, no reaction to light in either. Fundus normal. Knee-reflexes absent. May 19, 1913: Wassermann: serum ++++, spinal fluid +; cell-count 19, globulin, +, reduction +. Puncture, increased pressure; fluid clear.

SUMMARY

On account of the necessary length of this communication, we have concisely summed up the net results by dividing the cases into early and late: those in which infection occurred two years previously to our observation are classed as early; those in which infection occurred prior to that time as late.

Early Syphilis.—There were thirty-six of the early cases, three of which (Cases 9, 36 and 91) gave a positive serologic reaction in the spinal fluid and a high cell-count (8.3 per cent.). In Case 9 there were no clinical symptoms whatever, but the spinal fluid gave a cell-count of 30 and an increase of globulin. In Case 36, the reflexes were sluggish with no other clinical symptoms; the cell-count was 42 with an increase in the globulin content. The patient in Case 91 had an early syphilis and had had two salvarsan and two neosalvarsan injections together with adequate intramuscular mercurial treatment. The spinal puncture was incited by the sudden irregularity of pupils and headache. The fluid showed positive findings.

In none of these early cases giving a positive spinal reaction were there any active cutaneous manifestations. Four of this group of early infections gave a negative serologic reaction and a cell-count above 10 (Cases 17, 39, 45 and 96); the cell-count in these cases was 17, 12, 12 and 16, respectively, which in the presence of no clinical symptoms and a negative serologic test in the

spinal fluid, is probably of no pathognomonic significance.

Late Syphilis.—There were sixty-four of the late cases, twenty-one of which (34.4 per cent.) gave a positive serologic reaction (Cases 1, 5, 7, 8, 20, 21, 22, 23, 35, 42, 49, 56, 67, 71, 75, 79, 81, 86, 87, 90 and 99); sixteen of these showed definite clinical symptoms of cerebrospinal syphilis, ranging from headache and pupillary changes to definite symptoms of tabes and paresis (five were tabetic, four paretic and four hemiplegic), which leaves five cases with no clinical symptoms referable to the nervous stystem (Cases 1, 8, 49, 67 and 86). In Case 1 the patient had congenital lues with double iritis. In Case 8 the patient was apparently normal with the exception of a serpiginous ulcer of arm. In Case 49 there was a systolic murmur. In Case 67 there were no clinical symptoms whatsoever. In Case 86 the patient had symptoms of duodenal ulcer.

Of the twenty-nine patients showing cutaneous manifestations of acquired syphilis only one (Case 8) gave a positive spinal reaction (3.4 per cent.). In thirteen cases of the late group there was a cell-count in the spinal fluid above 10, with a negative serologic reaction; in seven a cell-count of 12; in one of 15; one of 17, and three of 20, all of which gave a negative globulin content except one which showed a slight increase. In Case 78, the cell-count was 43 with an increase of globulin. This patient also gave a negative Wassermann in the blood but was suffering from an aortic aneurysm, probably the result of an old cured syphilis.

Of the one hundred cases included in this report, only six had a positive spinal fluid[5] with no clinical symptoms of involvement of the central nervous system. One of these was congenital, two visceral and one showed late cutaneous lesions.

During the course of our investigation, we were quite anxious to determine whether, if some of the spinal fluid was removed and an intravenous injection of neosalvarsan followed immediately, the fluid removed would not be replaced with a fluid surcharged with arsenic. To determine this we selected four cases of paresis. In each of these a spinal puncture was made and 10 c.c. of fluid removed immediately after which a full dose of neosalvarsan was administered intravenously. Within forty-eight hours, in two of these cases puncture was again made; and in the remaining two, in ninety-eight hours. The fluid was then examined for the presence of arsenic by the Gutzeit and Marsh methods fully controlled, with negative results in all four cases.

From the number of cases included in this report, one is not justified in being dogmatic, but the study seems to demonstrate that (1) only a comparatively small percentage of those infected by the *Spirochaeta pallida* give serologic and cytologic evidence of cerebrospinal invasions, and (2) when such an invasion does occur there are usually early clinical manifestations of it, which substantiate clinical observation.[6]

Before closing we wish to thank Dr. George Dock of the Washington University for his kindness in allowing us to use some of his cases from the wards, and also, Dr. Walter Fischel and Dr. H. N. Lyon of the Barnard Free Skin and Cancer Hospital, for the physical examinations of the patients from that institution.

5. Positive spinal fluid, meaning a positive Wassermann reaction in the fluid with a cell-count above 10 and an increase of the globulin content.

6. In those patients on whom subsequent spinal punctures were made after intravenous injection of salvarsan and neosalvarsan there was no material change noted in the spinal fluid in the large majority of cases. We hope to report on this later.

ABSTRACT OF DISCUSSION

DR. F. G. HARRIS, Chicago: It has been shown that in a large number of cases of secondary syphilis there is involvement of the spinal fluid. The percentage of cases in which this occurs differs according to the reading of different observers, but we know that it is comparatively large. The cerebrospinal axis is affected early, in my experience, and these are the cases that later develop tabes and paresis and cerebrospinal syphilis. The spinal fluid is a true secretion, and our antisyphilitic remedies circulating in the blood have little effect on it, as they do not reach it. As long as a case of syphilis shows a positive reaction of the cerebrospinal fluid, it should still remain under treatment.

DR. DAVID LIEBERTHAL, Chicago: The assertion made by some that any case of syphilis in which the cerebrospinal fluid shows a positive Wassermann will, if left untreated, eventually develop into tabes or paresis or cerebrospinal syphilis is too broad. We have lost sight of the fact, apparently, that there is a natural healing process in connection with syphilis. If we review the statistics of cases of syphilis, treated and untreated, we shall find quite a large number of the latter in which the patients never developed any of these nervous affections. We are not in a position to prove that those cases showing a positive reaction in the cerebrospinal fluid will develop paresis or tabes: this can only be proved or disproved in the course of time. The authors stated that under the administration of neosalvarsan, the findings in the cerebrospinal fluid improved. I believe that mercury gives still better results. I use both salvarsan and neosalvarsan, but not to the exclusion of mercury. I do not limit my time of treatment of syphilitic patients to three years or to five years or even longer, and I advise them to keep themselves under observation for the rest of their lives, even in those cases in which the Wassermann has been negative for a year or longer.

DR. H. G. IRVINE, Minneapolis: I should like to call attention to the fact that these late syphilitic manifestations are very resistant to treatment. I should like to ask Dr. Buhman what his results have been in changing the positive Wassermann to a negative by treatment.

DR. M. L. HEIDINGSFELD, Cincinnati: I should like to ask Dr. Buhman if these cases have been followed by subsequent spinal puncture. If so, with what result? Dr. Buhman's work exercises a therapeutic control over selected cases that would be otherwise entirely lacking. The therapeutic efficacy of salvarsan can hardly be questioned in these cases. Mercury may effect some good here and there. Four hundred years of experience has shown that it utterly fails in the vast majority of instances. Syphilis shows one peculiarity in that it often directs its influence against one special system, and I believe that for that reason we often see a positive cerebrospinal fluid, when the nervous system is attacked, and a negative blood Wassermann.

DR. H. H. HAZEN, Washington, D. C.: It has been noticed that an intravenous injection of salvarsan is often followed by a positive Wassermann in the blood in from seventeen to forty-eight hours. Will Dr. Buhman tell us if this is also true of the cerebrospinal fluid?

DR. RUDOLPH BUHMAN, St. Louis: In reply to Dr. Harris I would say that in our work the blood and cerebrospinal fluid are obtained simultaneously, and that all the cases that did not give a positive blood or spinal-fluid reaction were thrown out. I cannot make any definite statement as to the effect of treatment on a positive spinal-fluid reaction, as I do not think that sufficient time has elapsed between the first and succeeding spinal punctures to draw any positive conclusions. In three of the cases, however, in which there was definite involvement of the nervous system, with positive blood, spinal-fluid and cytologic findings, the patients received five or six injections of salvarsan, and at the end of a year the findings were still practically unchanged with the exception of a lower cell-count. I have had no experience with the provocative treatment of the spinal fluid, but I have had experience with this treatment of the blood.

CHRONIC ADHERENT PERICARDITIS

A STUDY OF SIXTY-TWO CASES *

WILLIAM H. SMITH, M.D.
BOSTON

A study of the necropsy records of the Massachusetts General Hospital was made to find out the number of cases with adherent pericarditis. My attention was attracted to this condition, always difficult of diagnosis, by the presence of extensive adherent pericarditis in two cases which came to necropsy in quick succession in which the endocarditis was so extensive that the diagnosis of adherent pericarditis was not considered. Out of 3,053 necropsies at this hospital (1897-1913) there were 62 in which pericardial adhesions, complete or partial, were present. It was hoped that a study of these 62 cases would lead possibly to a more frequent diagnosis of this condition, or perhaps explain the cause of the frequency with which it has been overlooked.

ETIOLOGY

All of the 62 cases were studied with a view to a causative factor in the production of the pericarditis. In 6 cases syphilis was present. In 20 cases tuberculosis, active or healed, was found post mortem. Active tuberculosis was present in the lymph-nodes in 3 cases, in the lungs in 6; obsolete tuberculosis of the lymph-nodes in 6 cases, of the lungs in 2; tuberculosis of the adrenals in 2 cases, and general miliary tuberculosis in 1 case.

In 28 cases rheumatism was present in the previous history. In 34 it was doubtful or absent. There were 42 males and 20 females; 7 of the patients were children aged 13 or younger. The youngest patient was aged 7, the oldest 75. The proportion of children to adults entering the Massachusetts General Hospital is about 1 : 6.

Since the adhesive pericarditis in some of these cases was apparently of the so-called "silent" type, that is, did not account for the patient's death, unless in some way at present not understood, it seemed wise to divide these cases into two groups:

Group 1 includes those in which the pericarditis, whether complete or partial, was apparently a "silent" factor, since the patient died from some other direct cause, as cancer, tuberculosis or after operation. A study of the clinical record showed no symptoms pointing directly to the heart at the time of death. There were 26 cases in Group 1.

Group 2 includes all of those cases in which death was associated with cardiac symptoms. The division must be arbitrary because the incidence of endocarditis in Group 2 could explain the cardiac symptoms, even were there no adherent pericarditis present. There were 36 cases in Group 2.

A study of these two groups of cases brought out several interesting facts. 1. The average age in Group 1 is higher than in Group 2. 2. Antecedent rheumatism is prominent in Group 2. 3. Endocarditis is prominent in Group 2. 4. Pericardial and pleuropericardial adhesions are more extensive in Group 2. In Group 1, in which cardiac symptoms were not prominent, there were no children, and the average age was 47.7 years, while in Group 2 with prominent cardiac symptoms there were 7 children, and the average age was 35.4 years.

An age chart of the cases in Group 1 as contrasted with those in Group 2 is instructive.

A glance at the age chart shows that in the first four decades there were only 10 deaths in Group 1, while in Group 2 during the same decades there were 23 deaths. Although the number of cases is small, these figures suggest one of two conclusions; either adherent pericarditis is of less importance after the age of 40, or before the age of 40 it is likely to be associated with other conditions, or is perhaps in itself more serious.

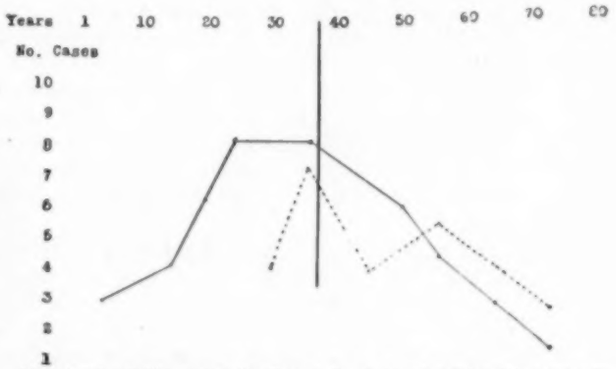
The incidence of rheumatism in these two groups is worthy of note. While in Group 1 there were 6 cases with a definite history of rheumatism, there were 22 cases in Group 2.

The association of rheumatism with endocarditis is well known. It is not surprising, therefore, to find only 7 cases of endocarditis in Group 1, in which the incidence of rheumatism in the previous history was unimportant.

On the other hand, it is of interest in Group 2 with rheumatism present in the history of 22 out of 36 cases, to find that there were 27 cases of endocarditis.

The association of rheumatism with pericarditis receives added support from a study of the type of pericardial adhesions in Groups 1 and 2.

In Group 1 general adhesions were present in 12 cases, partial adhesions in 14; while in Group 2, in which rheumatism was prominent in the previous history of



Age chart of the cases in Group 1 as contrasted with those in Group 2. Group 1, line of dashes; Group 2, solid line. In Group 1 there were 26 cases; in Group 2, 36 cases. In one case the age was not stated.

the cases, general adhesions were present in 27 cases, and partial adhesions in 9.

A point of possible interest is brought out by the study of the pleuropericardial adhesions. They were found 3 times, or 11 per cent. in Group 1, and 13 times, or 36.1 per cent. in Group 2.

It is striking that dividing these 62 cases into Groups 1 and 2, dependent on whether or not the patient died with cardiac symptoms, should apparently make certain definite deductions possible. In Group 1, in which the pericarditis was of the so-called symptomless, or "silent" variety, the patients were older, rheumatism was rare in the past history and endocarditis not prominent; partial pericardial adhesions were more frequent than general adhesions.

In Group 2, in which the pericarditis was associated with cardiac symptoms, the majority died before the age of 40, and rheumatism was prominent in the past history. Endocarditis was present in three-fourths of the cases, pleuropericardial adhesions were more numerous, and the pericardial adhesions were more extensive.

Since the heart-weight in the adult is from 200 to 300 gm., and there were no children in Group 1, if pericardial adhesions or pleuropericardial adhesions increased the work of the heart we should expect to find

* From the West Medical Service of the Massachusetts General Hospital.

increase in the size of the heart. A study of the heart-weights in the group showed in the 20 cases without endocarditis only 10 with a weight exceeding 300 gm. Of these 10 the heart-weight of five exceeded 350 gm.

In these 5 cases with this degree of cardiac enlargement there were 3 cases with arteriosclerosis, 1 case of exophthalmic goiter, and 1 case of subacute glomerulonephritis. Cardiac enlargement is present frequently in each of the foregoing conditions, so that the heart hypertrophy may have been caused in part in these 5 cases by the associated disease as well as by the adhesions.

Of the 6 cases in Group 1 with endocarditis, 5 had a degree of heart enlargement exceeding 350 gm.; 1, 732; 2, 528; 3, 510; 4, 403; 5, 370. The average weight of the hearts in this group was 352 gm. Cardiac enlargement was not marked in those cases in which tuberculosis may have been a factor in the production of the adherent pericarditis in the absence of endocarditis or nephritis. The average weight of the heart was but 340 gm.

From the study of the effects of adhesions it would seem from these cases in Group 1 that no marked increase in the size of the heart need follow slight adhesions, bands or even pericardial obliteration, in the absence of some other well-recognized cause for heart enlargement, as endocarditis, nephritis or arteriosclerosis.

In one case, in a woman aged 28, in which both pleural cavities were obliterated as well as the pericardial cavity, with binding down of the sternum, the heart-weight was but 377 gm.

A study of the clinical records failed to show any heart murmurs in these cases in Group 1 which were not to be explained by the associated endocarditis, arteriosclerosis and relative mitral regurgitation present.

The unimportant Group 1 may be dismissed from further study.

Two striking things in Group 2 are noted: (1) the presence of one or more rheumatic attacks in the history in 22 of the 36 cases; (2) the presence of endocarditis in 27 of the 36 cases.

The diagnosis of rheumatism is so ill-defined that great care in attributing rheumatism as a factor in the production of adherent pericarditis was taken. Careful examination of the previous record showed that in 13 of the 22 cases there was no doubt of the previous rheumatic infection; in 5, the diagnosis of a previous rheumatic attack was probable; in 4 it was possible.

In the etiology of these cases of adherent pericarditis in Group 2 there was no other infective disease so prominent in the previous history as rheumatism. In 8 cases tuberculosis of a bronchial or mesenteric lymph-node was found post mortem.

The 27 cases of endocarditis in Group 2 were as follows:

Acute endocarditis alone, 6:	
Aortic and mitral	4
Aortic alone	1
Mitral alone	1
	6
Chronic endocarditis alone, 12:	
Aortic and mitral	5
Aortic alone	1
Mitral alone	3
Aortic, mitral and tricuspid	2
Aortic, mitral, tricuspid and pulmonary	1
	12
Acute and chronic, 9:	
Aortic and mitral	6
Mitral alone	1
Aortic, mitral and tricuspid	2
	9

The influence of the adherent pericardium is difficult to determine in the presence of endocarditis of such extent as in Group 2. The mitral and aortic valves showed endocarditis 15 times, mitral alone 5, aortic alone 2, aortic, mitral and tricuspid 4, and aortic, mitral, tricuspid and pulmonary 1. In the endocardial damage itself, sufficient cause for death existed if we judge from similar cases of endocarditis without adherent pericarditis.

It is of interest that of these patients with positive, probable, or possible rheumatic infection, endocarditis was present in every case except one.

In group 2 the heart-weights are available in 31 of the 36 cases. The weight of the heart was over 300 gm. in 29 of the 31 cases:

Gm.	Cases.	Gm.	Cases.
300-400	6	820	1
400-500	7	1,150	1
500-600	8	1,273	1
600-700	3	1,328	1
700-800	1		

In 7 of the cases the pathologic condition made it necessary to include the pericardium in the heart-weight.

The average weight of the heart in this group was 592 gm.

It is impossible from a study of these cases to state what part the pericardial adhesions may have had in the production of the cardiac hypertrophy. The fact that cardiac hypertrophy was not marked in the cases in Group 1, in some of which the adhesions were equally extensive, would point toward the belief that the cause of the heart hypertrophy is more apt to be associated with the primary rheumatic condition or the associated endocardial lesion.

Attention has been called to the effect of the toxin on the myocardium in cases of acute rheumatic infection, notably by Fisher.[1] He says:

> **The view that rheumatism can produce toxic enlargement of the heart is also supported by the fact that in rare instances cardiac hypertrophy and dilatation may be seen in the post-mortem room following rheumatism when neither pericardial adhesions nor lesions sufficient to interfere with the function of the heart valves prove to be present. Isolated cases have been reported in which, post mortem, marked changes in the myocardium follow rheumatic infection.**

Weil and Gallavardin[2] have recently reported such a case.

Fenton lays more importance on the effect of the rheumatic poison on the heart muscle than on the endocardial or pericardial changes. He says:[3]

> **The train of events, which leads up to the clinical picture noted in connection with chronic adherent pericarditis, appears to be that the main pathologic condition associated with this lesion is one of dilatation, the result of the action of the rheumatic poison on the heart muscle and subsequent hypertrophy. Dilatation takes place during the acute or subacute periods of the phase which precedes the chronic adhesion. In a few mild cases it may pass off, but in the great majority it does not, and hypertrophy and external adhesions follow, resulting in a condition of unstable equilibrium in which the constant tendency is to increase dilatation and failure, owing partly to a certain amount of embarrassment to systole, caused by external adhesions, but mainly to a permanent damage to the heart muscle, in a measure resembling those cases of chronic cardiac failure in more advanced life in which there is nothing to account for the symptoms but functional change in the properties of the heart muscle, and which is generally accompanied by progressive decline in its powers.**

1. Fisher, T.: Brit. Med. Jour., 1907, i, 840; Clin. Jour., 1907, xxx, 308.
2. Weil and Gallavardin: Arch. de méd. des enf., 1900, ii, 193.
3. Fenton: Adherent Pericardium, Practitioner, lxxxi, 637.

The presence of nephritis in 11 of these cases in Group 2, in 6 of the glomerular type, makes it even more difficult to attempt an interpretation of the part the pericardial adhesions may have played in the heart enlargement.

The effect of adherent pericarditis in the absence of a rheumatic infection in the history, and in the absence of endocarditis may be studied in the 8 remaining cases in this group. The heart-weights are available in 7 of the 8 cases. In 6 of the 7 cases the weights were over 400 gm.; in one, a boy of 10, with adherent pericarditis, following osteomyelitis, the heart-weight was 135 gm. A glance at the chief cause of death in these cases with enlarged heart shows that the adherent pericarditis apparently was of no great importance in the production of the heart enlargement, or in the cause of death.

1. Arteriosclerotic nephritis, cardiac thrombosis.
2. Chronic interstitial nephritis, coronary arteriosclerosis, chronic lead-poisoning.
3. Amyloid nephritis, syphilis, hypertrophy, dilatation of heart.
4. Aneurysm of aorta.
5. Dissection aneurysm with rupture.
6. Arteriosclerosis, cardiac thrombosis.
7. Osteomyelitis, empyema.
8. Chronic interstitial myocarditis with cardiac aneurysm, chronic pleuritis, perihepatitis and perisplenitis.

In Case 8, with pleuritis, perisplenitis and perihepatitis, the condition of the pericardium is stated to be as follows: In the region of the apex over the wall of the left ventricle, near the interventricular septum, there is a broad band of dense, fibrous tissue binding the parietal and visceral pericardium together. The incidence of lead in one, and syphilis probably in three, is of interest in these cases.

Careful analysis of the murmurs recorded in the records in these cases of Group 2 failed to show any murmurs which could not be explained by the associated endocarditis, or by the heart condition, independent of the adherent pericarditis.

The reason why adherent pericarditis is overlooked is apparent from a study of these two groups of cases. In the first place, the direct signs or symptoms suggesting the cardiac condition are so slight that attention is not attracted to adherent pericarditis as a possibility, in the presence of some other prominent, well-defined condition from which the patient is suffering. On the other hand, judged by this group of cases, in which cardiac symptoms were present, and adherent pericarditis might have been considered, in only one case of the 37 was there no other cardiac or renal manifestation which might not explain the cardiac symptoms. With endocarditis present in 27 of the 36 cases in the group in which cardiac symptoms were prominent, and well-defined pathologic changes present to account for the cardiac symptoms in 8 of the 9 remaining cases without endocarditis, there is left but a single case of cardiac death in which, post mortem, no endocarditis and no glomerulonephritis were present.

In this one case, in a girl of 11, with a previous rheumatic history who died from cardiac decompensation, the anatomic diagnosis was chronic adhesive pericarditis, hypertrophy and dilatation of the heart; chronic passive congestion of lung, liver, spleen and kidneys; ascites; hydrothorax; slight edema of lower extremities, and hypoplasia of uterus. The pericardial sac was everywhere adherent to the surface of the heart by firm connective tissues.

A study of the clinical record of this case shows that the heart impulse was palpable with corresponding dulness just beneath the sixth rib, 10 cm. from midsternum, from 3 to 5 cm. outside the nipple line; to right 2 cm. outside the third space. Action regular, rapid; loud, blowing systolic murmur at apex, replacing first sound, transmitted to axilla. Pulmonic second accentuated. Same murmur heard over precordia and back. Pulses equal and synchronous, of small volume and low tension. Liver from the sixth rib to 4 cm. below costal margin, nipple line. Considerable edema of feet and legs. White count 34,000.

Endocarditis, acute or chronic, would be a much more usual diagnosis to make in this case with decompensation, a loud transmitted murmur, with cardiac enlargement and leukocytosis. The apex in the sixth space, in the absence of nephritis, should not have permitted the diagnosis to be mitral regurgitation, unless that regurgitation was a relative mitral regurgitation associated with the left ventricular hypertrophy; or if so considered organic mitral disease, some other cause for the left ventricular hypertrophy should have been sought.

In 33 of the 36 cases in Group 2 the adherent pericarditis may be said to have been of the cardiac type. In three patients there was an associated perihepatitis and perisplenitis. In one, a boy of 7, the abdomen required frequent tappings; in the other two, women of 35 and 65 years, respectively, no ascites could be demonstrated. In one patient ascites was found post mortem.

No attempt has been made in the study of these cases to determine the clinical manifestations of the adhesive pericarditis. Analysis of the cases in Group 2 will be made later with this point in view.

From a study of these 62 cases, in which adherent pericarditis was present at post mortem at the Massachusetts General Hospital, two groups may be made, as in the accompanying tabulation.

GROUPING OF SIXTY-TWO CASES IN WHICH ADHERENT PERICARDITIS WAS PRESENT AT THE POST-MORTEM

	Group 1.	Group 2.
Cases without cardiac symptoms	26	36
Average age, years	47.5	35.4
History of rheumatism	6	22
Endocarditis	6	27
Cardiac enlargement	not marked	marked
Average heart-weight, gm.	352	592
Pericardial adhesions	less extensive	extensive
Pleuropericardial adhesions	rare	common

CONCLUSIONS

1. From a study of these cases, it may be said that adherent pericarditis may be impossible of diagnosis in cases like those of the first group unassociated with cardiac symptoms, cardiac enlargement or murmurs. The diagnosis under such conditions is unimportant, as in this type of the disease it probably contributes but little to the disability of the patient.

2. A second type in young adults, with a previous rheumatic history, with associated endocarditis, is serious. Adhesive pericarditis is overlooked because the coincident endocarditis appears in the foreground. Adhesive pericarditis should always be thought of in a young adult whenever rheumatism followed by endocarditis appears in the history, and especially considered when the cardiac failure is more marked or the cardiac enlargement more extensive than the endocardial damage seems to warrant.

3. More careful records should be made of the presence or absence of cardiac dilatation in cases of acute rheumatism without endocarditis or pericarditis.

377 Beacon Street.

THE INTENSIVE TREATMENT OF SYPHILITIC NERVOUS AFFECTIONS CONTROLLED BY EXAMINATIONS OF THE CEREBROSPINAL FLUID*

A PRELIMINARY REPORT

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LOS ANGELES

It is true that any method of treatment of syphilis will be judged eventually by its power to prevent the development of the so-called parasyphilitic and metasyphilitic affections, and its power to eradicate the infection in the central nervous system, and thus to cure or to arrest the progress of the disease in those patients in whom the late nervous affections have already developed. The degree of improvement must always depend upon the extent and the location of the destructive and sclerotic changes that have already occurred.

It has now been demonstrated quite certainly that the parasyphilitic and metasyphilitic affections are phenomena associated with active syphilitic infection localized either in the central nervous system or in the blood-vessels. The demonstration has been made not only by finding the Wassermann reaction positive in the blood or cerebrospinal fluid in a very large percentage of such cases, but also by finding the specific organisms of syphilis in the brain (Noguchi and Moore[1]) or blood-vessel walls (Longcope[2] and others) in a considerable percentage of the lesions examined after death.

The problems concerning the nervous affections are, therefore, three:

1. To prevent the localization of the infection in the central nervous system.
2. To discover such localization, if possible, before the parasyphilitic phenomena have developed.
3. To eradicate the infection, thus permitting the processes of nature to restore and reeducate the patient to whatever degree is possible.

The first problem scarcely needs discussion, for any treatment that is effectual in eradicating an established infection of the central nervous system will be effectual in preventing the localization there. It need be said only that the earlier the diagnosis is made and treatment established, the surer will be the power of the treatment to prevent such localization.

MATERIAL, TECHNIC AND CONTROLS

My study of the two other problems is based upon an analysis of the examinations of ninety-six cerebrospinal fluids obtained from seventy patients, and on the treatment of fourteen of those whose fluids showed evidence of syphilis. The fluids of these fourteen patients have been examined thirty-eight times. All examinations were made with reference to pressure (measured in millimeters in a capillary tube), cytology, butyric acid globulin test, and Wassermann test. A Wassermann test of the blood, also, was made in nearly every instance. The cells were counted in a Zappert ruled hemocytometer after mixing equal parts of cerebrospinal fluid and 0.6 per cent. acetic acid. Noguchi's butyric acid test was made with 0.2 c.c. of cerebrospinal fluid. In the Wassermann test of the blood, the acetone-insoluble fraction of beef-heart was substituted as antigen in the Wassermann system, and 6 antigenic units used; the quantity of each reagent in the original test was reduced to one-fifth; an extra tube containing only one unit of complement with two parts of serum was added; and native anti-sheep amboceptor was titrated with each test.

Each cerebrospinal fluid was carefully titrated with ten tubes; the first two tubes were controls and contained respectively 1 c.c. and 0.4 c.c. of cerebrospinal fluid with one unit of complement; the third and fourth tubes corresponded to the two test tubes of the Wassermann reaction, and in each were placed two units of complement; in each of the remaining six tubes one unit of complement was placed and the tubes were given respectively 0.2, 0.3, 0.4, 0.6, 0.8, and 1 c.c. of fresh undiluted, unheated cerebrospinal fluid. It should be noted that 1 unit of complement is 0.1 c.c. of a 1 to 10 dilution of guinea-pig serum. (Each day the complement was titrated.)

This quantity used with 1 c.c. of fluid makes an exceedingly delicate test, and one that must be watched and controlled with great care. If the reagents are skillfully titrated, however, if the test is well controlled, and if the cerebrospinal fluid is tested within a few hours after being drawn, so that it does not develop anticomplementary properties, the results are perfectly reliable.

Non-syphilitic patients: In the series of seventy patients there were twenty-six that were probably non-syphilitic. Wassermann tests of the blood were made in eighteen; all were negative even in the tube containing two parts of serum and one unit of complement. The cerebrospinal fluid of all twenty-four caused no fixation of complement, even in the tube containing 1 c.c. of fluid and 1 unit of complement. The pressure was obtained in thirteen instances and will be tabulated in a later report. The cells were increased above eight in two cases of meningococcus meningitis, one of acute poliomyelitis (240), and one case of probable brain tumor (11 mononuclears). The butyric acid test was strongly positive in meningococcus meningitis, poliomyelitis, one case of Pott's disease, and the case of probable brain tumor. It was definitely, though weakly positive in a case of arteriosclerosis and nephritis and was associated with a cerebrospinal pressure of over 340 mm. and blood-pressure of 228. The other tests were all negative or doubtful positives.

These twenty-six cases serve merely as controls for subsequent groups. There is nothing in them of especial interest except, perhaps, the case of nephritis and arteriosclerosis with high cerebrospinal pressure and a positive butyric acid test, and the case of brain tumor (not yet proved) with a strongly positive butyric acid test and a slight increase of mononuclear cells. Nine of the fourteen pressure determinations were 200 mm. or greater.

EARLY DETERMINATION OF SYPHILITIC LOCALIZATION IN THE CENTRAL NERVOUS SYSTEM

The cerebrospinal fluid has been examined in eleven cases of tertiary, latent and treated syphilis and in five cases of miscellaneous and atypical syphilitic cases. In the eleven cases, the patients showed no symptoms definitely pointing to organic nervous trouble. The Wassermann test of the blood had been or was positive in all. The examinations gave the following results:

Wassermann test, butyric acid test and cell-count positive	1
Wassermann test and butyric acid test positive and cell-count negative	3
Wassermann test negative, butyric acid test positive and cell-count negative	3
Wassermann test, butyric acid test and cell-count negative	4

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Noguchi and Moore: Jour. Exper. Med., Feb. 1, 1913, p. 232.
2. Longcope, Warfield T.: Syphilitic Aortitis; Its Diagnosis and Treatment. Arch. Int. Med., January, 1913, p. 15.

One of these patients with an indefinite history of syphilis eleven years before, had had a nervous breakdown one year ago from overwork, "nervous prostration." He had continued in a "neurasthenic" condition in spite of rest and travel and symptomatic treatment. There were no objective signs of syphilis or of parasyphilis, but his blood-test was strongly positive, and all three tests of the cerebrospinal fluid were strongly positive—0.1 c.c. of the fluid fixed 2 units of complement.

A patient with paroxysmal hemoglobinuria had no nervous symptoms. His blood gave an intensely positive Wassermann reaction, 0.1 c.c. of a 1 to 300 dilution fixed 1 unit of complement. His cerebrospinal fluid was positive to the Wassermann and butyric acid tests, but it required 0.4 c.c. of the fluid to fix one unit of complement. This case is a good demonstration of the absence of relation between the Wassermann reaction in the blood and that in the cerebrospinal fluid.

A patient with Argyll Robertson pupils and double vision had no history of syphilis and no other manifestations of the disease. He was a strong robust man and seemed perfectly healthy. The blood Wassermann test was suspicious and the cerebrospinal fluid gave positive Wassermann and butyric acid tests and showed 35 mononuclear cells per 1 c.mm.

It is well known that syphilitic infections of the central nervous system are far more difficult to eradicate than when the infection is located elsewhere, and that the blood Wassermann is far more easily made negative than that of the cerebrospinal fluid. Considering these facts and cases like the ones above noted one is led inevitably to conclude with Neisser[3] that "one ought not to stop treating any syphilitic patient, even if the reaction in the blood is negative, without an examination of his cerebrospinal fluid. True alterations in the central nervous system can exist without clinical manifestations of any kind, but which, discovered by the serologic, microscopic and chemical examination of the cerebrospinal fluid may be treated, and thereby ultimate and perhaps incurable aggravations may be prevented."

In the examination of the cerebrospinal fluid we unquestionably have means of discovering in most cases, whether or not the infection has localized in the central nervous system, and one or more of the three tests may remain positive long after the blood Wassermann has become negative. It is fair to assume that those patients with positive cerebrospinal fluids are promising candidates for the later organic nervous affections of syphilis, and if it is possible to change the fluid to normal they should be treated until the desirable end is accomplished.

TABES DORSALIS AND GENERAL PARESIS

In the incipient and atypical cases of tabes and paresis the examination of the cerebrospinal fluid is invaluable for establishing the diagnosis, and in the advanced cases it is necessary as a therapeutic guide.

In my series there are nineteen cases of tabes with twenty-eight spinal fluid examinations; ten cases of general paresis with twenty-three spinal fluid examinations. A Wassermann test on the blood was made in all nineteen of the tabes cases and was positive only three times, (15.8 per cent.). The test of the cerebrospinal fluid was positive eighteen times, (94.7 per cent.). The butyric acid test was positive seventeen times in seventeen tests, (100 per cent.). Cell counts were made in seventeen cases; the number of cells varied from 10 to 128 in 12 cases, (70.6 per cent.) and was below seven in the other five cases. The pressure varied from 80 mm. to 300 mm. with a mean of about 220 mm.

In the ten cases of general paresis, Wassermann tests on the blood were made nine times with only three positives (33.3 per cent.). The Wassermann tests and butyric acid tests of the cerebrospinal fluid were positive in 100 per cent. of the cases. The cells were counted nine times and were above 10 in only three cases (33.3 per cent.). The pressure varied from 140 mm. to 350 mm.

There is a decided difference between the percentages of positive findings in my cases and those of other workers, my blood positives being fewer while my cerebrospinal fluid positives are more numerous. The discrepancy in the blood findings is due probably to the fact that in many of my cases an examination of the cerebrospinal fluid was requested by the attending physicians because the blood Wassermann was negative, while the discrepancy in the findings in the cerebrospinal fluid is due probably to the fact that my Wassermann titrations were carried much further than is usually done, making the test more sensitive.

TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM

There are no detailed reports in the literature, as far as I have been able to examine it, of syphilis of the central nervous system thoroughly treated and controlled by repeated tests of the cerebrospinal fluid. In the few cases that do appear, details are lacking as to the number of injections of salvarsan given, the size of the doses, the use of mercury, or the technic of the Wassermann test especially with reference to the most important point of the actual quantity of complement used. Only one author has spoken of titrating the "antibody content" of the cerebrospinal fluid, and though he states how much cerebrospinal fluid he used, I cannot tell the quantity of complement. If I have interpreted him correctly, the last tube in my titrations is ten times as sensitive as his most sensitive test.

Temporary symptomatic improvement in the parasyphilitic affections has been seen with mercury and the iodids, with one or several injections of salvarsan, and there have been remissions even without treatment. To be sure, therefore, that symptomatic improvement is unquestionably the result of treatment, one needs very convincing evidence. This can be supplied best by careful repeated examinations of the cerebrospinal fluid. My treatment has consisted in intravenous injections of salvarsan and neosalvarsan combined with mercurial inunctions or "mixed treatment" to the point of tolerance.

The intravenous injections of salvarsan have been given at intervals of six weeks to ten days, governed according to the reaction on the part of the patient and the reduction in the strength of the tests of the cerebrospinal fluid. Occasionally neosalvarsan has been substituted. The size of the dose has usually been 0.6 gm., excepting first doses which sometimes have been 0.4 gm. or 0.5 gm.

The details of the cases are shown in the accompanying table:

In the twelve cases showing definitely positive Wassermann tests in the cerebrospinal fluid the mean reduction in the strength of the reaction was about 50 per cent. for every three injections of salvarsan. I have made it a practice to examine the cerebrospinal fluid three to four weeks after every third injection. If treatment is effec-

3. Neisser: Les principes du traitement moderne de la syphilis, Rev. méd. d'Egypte, 1913, p. 9. Quoted by Henri Roger: Presse méd. April 6, 1913, p. 305.

EXAMINATION OF CEREBROSPINAL FLUIDS IN SYPHILITIC NERVOUS AFFECTIONS

Case	Diagnosis	Intravenous Salvarsan	Hg.	Duration of Treatment. Months	Blood Wassermann	No. of Sp. fl Exams.	Pressure in mm.	Cells in 1 c.mm.	Butyr. Acid Test with 0.2 c.c.	Wass. Test Measured by Quantity Necessary to Fix 1 Unit of Comp., i.e., 0.1 c.c. 1-10 dil. g.p. serum.	Reduction of Wass. Test Per Cent.	Remarks
1. G. H. ...	G. P.	12	Inunctions and mixed	8½	2 neg.	7	350 reduced to 160	Not increased	++++ reduced to +	0.1 c.c. fixed about 1⅔ units, reduced so that 0.4 c.c. fixes 1 unit.	85	Marked symptomatic improvement.
2. Dr. B. ..	G. P., incipient	7	Inunctions	4	+ reduced to neg.	3	220 reduced to 170	Not increased	+++ reduced to +	0.1 c.c. fixed 1 unit, reduced so that 0.3-.4 c.c. fixes 1 unit.	70	Marked symptomatic improvement.
3. J. W. G..	G. P., incipient	3	Inunctions	2	negative	2	150	Not increased	+ reduced to Negative	1 c.c. fixed 1 unit reduced completely so that 1 c.c. produced no fixation with 1 unit.	100	Well symptomatically.
4. McD. ...	G. P.	4*	Hg Cl_2 by mouth	1¼	++++ 0.1 c.c. 1-10 dil. fixed 2 units	2	140 to 240	42 reduced to 13	++++ reduced to ++	0.1 c.c. of 1-10 dil. fixed 1 unit, reduced so that 0.3 c.c. of 1-10 dil. fixes 1 unit.	66	Slight improvement.
5. P. B. ...	G. P., incipient	8	Inunctions and mixed	5	+++ reduced to neg.	3	270 reduction ?	? to 18	++++ reduced to ++	0.1 c.c. fixed more than 2 units, reduced so that 0.3 c.c. fixes 1 unit.	86	Marked improvement, gained 18 pounds.
6. Z. O. ...	G. P.	3	Inunctions	2	Negative	2	170 to 210	Not increased	++ reduced to +	0.5 c.c. fixed 1 unit, reduced so that 0.8 c.c. fixes 1 unit.	37	Marked improvement, gained about 15 pounds, no more double vision.
7. T. G. ...	Tabes. Optic Atrophy Progressive Tabes	6	Inunctions	5	Negative	3	220 reduced to 150	48 reduced to 8	++ reduced to +	0.5 c.c. fixed 1 unit, reduced so that 1 c.c. neg. with 1 unit.	100	No further progress of optic atrophy, gained 8 pounds in weight.
8. G. S. A..		3	Mixed	1½	Negative	2	220 to 210	74 to 66	+++ to +	0.4 c.c. fixed more than 1 unit, reduced so that 1 c.c. fixes 1 unit.	60	Cessation of pains, gained 4 pounds.
9. T. F. W.	Tabes	3	Mixed	2	Negative	2	220 to 110	6 to 10	+++ to +	0.2 c.c. fixes 1 unit, reduced so that 1 c.c. fixes 1 unit.	80	Cessation of pains, gained 2 pounds.
10. D. A. C...	Tabes	7	Mixed	5	+ to negative	4	180 to 160	Not increased	++ to +	0.1 c.c. fixed about 1.5 units, reduced so that 0.2 c.c. fixes 1 unit.	66	Improvement in gastric symptoms and general condition. Had no pains.
11. P. W. ...	Tertiary syphilis	3	Inunctions	2½	+ to negative	2	120 to 170	Not increased	++ to neg.	0.2 c.c. fixed 1 unit, reduced so that 1 c.c. neg. with 1 unit.	100	Marked improvement in general nervous condition.
12. D. R. F..	Tertiary syphilis	3	Inunctions	3	+ to negative	2	220 to 310 (?)	Not increased	+++ to +	1 c.c. weak positive with 1 ur't, reduced so that 1 c.c. neg. with 1 unit.	—	Marked improvement in general nervous condition.
13. Mrs. S...	Migraine, unequal pupils, history of leg ulcer	3	Hg I_2 by mouth	2	Negative	2	120 to 160	Not increased	++ to +	1 c.c. weak positive with 1 unit, reduced so that 1 c.c. neg. with 1 unit.	—	Headaches not much better. Improvement in general condition. Gain in weight. Doubtful case.
14. G. M. ...	Paroxysmal hemoglobinuria	3	Inunctions	2	++++ 0.1 c.c. 1-300 dil. fixed 1 unit, reduced so that 0.1 c.c. 1-20 dil. fixes 1 unit.	2	? to 120	Not increased	++ & ++	0.4 c.c. fixed 1 unit, reduced so that 1 c.c. fixes 1 unit.	60	Marked gain in blood and weight. No further attacks of hemoglobinuria.

* Neosalvarsan.

tual definite results should be shown. If good results are not obtained the treatment is modified either from the mercury or salvarsan side, the intervals between injections may be shortened or the size of the dose increased.

It has been interesting to note that when no symptomatic improvement has occurred during a certain period of treatment, the cerebrospinal fluid has shown no reduction in the strength of the tests. In no instance have I seen an increase in the number of cells or in the strength of the butyric acid test or Wassermann reactions, but the pressure in four cases has been higher after treatment.

Sometimes the strength of the Wassermann reaction decreases more rapidly than the globulin reaction, while at other times the reverse is true. There has been no relation between the tests in the blood and in the cerebrospinal fluid.

The Wassermann reactions have become negative in three of the cases, and in two of these the globulin reaction has become negative also. Two of these patients were small men on maximum doses of salvarsan, and the third had a very weak reaction at the beginning of the treatment.

I am beginning to feel that we have been too timid in the use of salvarsan in these cases, and that to accomplish the very difficult task of eradicating the infections we must increase the size of the dose, at least in those that bear the salvarsan well. The patients are in a desperate state, and even though it be a risk to give the larger doses, when the tests are not responding to the usual ones, I feel that the risk should be taken. I have estimated what I consider a safe yet effectual dose by taking as a criterion the manner in which the ordinary doses have been borne by my neuropathic patients of light weight, and I am now giving salvarsan to those who bear it well in the proportion of 0.1 gm. for every 20 pounds of body-weight. I feel that small doses of 0.3 gm. or 0.4 gm. are worse than useless in the infections of the central nervous system, and that they serve only to stir up the infection.

The criteria that I have accepted for negative cerebrospinal fluids are stringent, and impose a hard task on any form of treatment. I feel, however, that the intensive treatment, salvarsan in sufficient doses with mercury, is meeting the demand, and in time I anticipate negative fluids in all the other cases under treatment. After the fluids become negative, I am advocating at least three more injections of salvarsan and then an examination of the fluid every three months for at least a year.

What nature can do toward restoring lost faculties and functions to these unfortunate patients after the infection has been eradicated and the pathologic processes arrested no one can yet tell, for the eradication of infection has not yet been accomplished so far as we know.

Perhaps Swift's[4] method of intraspinous injection of serum withdrawn after one hour from the salvarsan treated patient may prove to be the method of choice, though it is a difficult one. Swift has not yet published detailed reports of his cases, and they are not at present available for comparison with mine.

SUMMARY AND CONCLUSIONS

1. As a working hypothesis we may assume that syphilitic patients with positive findings in the cerebrospinal fluid have the infection localized in the central nervous system or meninges, and are candidates for the late syphilitic nervous phenomena.

2. Every syphilitic patient should have his cerebrospinal fluid examined, and in positive cases the treatment should be continued in an effort to change the fluid to normal. The positive tests in the cerebrospinal fluid are much more difficult to reduce than the Wassermann reactions in the blood, therefore a negative blood is not a criterion of cure.

3. There is little or no relation between the blood Wassermann and the reactions of the cerebrospinal fluid.

4. In the treatment of fourteen cases of syphilis of the central nervous system, thirty-eight examinations of the cerebrospinal fluids have been made and sixty-eight intravenous injections of salvarsan have been given along with vigorous mercury treatment. Two positive fluids have been changed to normal, and in another the Wassermann reaction has been completely reduced, while the globulin reaction became weakly positive.

The mean reduction of the Wassermann reaction has been about 50 per cent. for each group of three injections of salvarsan. Symptomatic improvement has been roughly parallel with the reductions of the reactions in the cerebrospinal fluids.

5. The intensive treatment of syphilitic affections of the central nervous system has not yet been proved a failure, and when carried far enough and properly controlled it offers great promise for the future of these hitherto incurable patients. The method is probably capable of further development, and its efficiency may be greatly enhanced.

Security Building.

4. Swift and Ellis: New York Med. Jour., July 13, 1912.

ABSTRACT OF DISCUSSION

DR. A. B. DOCHEZ, New York: Dr. Brem has pointed out that one of the most serious manifestations of syphilis is involvement of the central nervous system. It is not, I think, an infrequent experience in the treatment of syphilis, that certain patients, even after the most thorough treatment with salvarsan and mercury, may show a discouragingly persistent Wassermann reaction in spite of the fact that whatever visible lesions may have been present have responded quite readily to treatment. Examination of the spinal fluid in a number of these cases has shown extensive infection of the central nervous system. The manifestations of such involvement may be relatively slight and the patient may for a long time exhibit only minor symptoms and possibly few objective clinical findings. Even in such cases examination of the spinal fluid may show evidence of marked irritation. It is difficult, through the medium of the blood, to get medicaments of any kind into contact with the meninges, because of the resistance offered to their passage by the chorioid plexus. This is the probable explanation of the persistence of these types of infection and their refractoriness to treatment, even when syphilitic lesions in other locations clear up promptly. In view of the increased possibilities of treating syphilis efficiently to-day it would seem especially desirable to attempt to control the disease before infection of the central nervous system has occurred. It is not uncommon in the care of syphilis to wait before beginning treatment for either the appearance of secondary manifestations or the development of a positive Wassermann reaction in the blood. Syphilis, as everybody knows, begins as a purely local infection. The presence of secondary manifestations and of a positive Wassermann are the signal of general invasion of the body by the virus. The time during which the infection remains localized is not definitely known, but probably the earliest development of a positive Wassermann in the blood is about six days after the appearance of the initial lesion. The ease with which spirochetes can be recognized during the early stages of the chancre makes it extremely important that a diagnosis should be made during the period of localized infection. Treatment of these cases thoroughly carried out gives the best hope of cure, whereas the delay that attends waiting for the diag-

nosis to become evident means a general dissemination of the virus with probably either visceral or central system involvement with their attendant burdensome and tedious treatment. The importance of lumbar puncture in cases of syphilis, which Dr. Brem has emphasized, is becoming more and more recognized. The frequency with which an involvement of the central nervous system is demonstrable during the secondary period of syphilis makes it practically imperative that such a condition should be ruled out by objective evidence. The early recognition of secondary syphilitic meningitis is of primary importance inasmuch as this condition usually persists over a long period of time and in the end may be responsible for the syphilitic lesions of tabes and paresis.

DR. R. C. CABOT, Boston: The brilliant work of Swift, at the Rockefeller Institute, New York, has not been referred to, nor the importance of treating these patients by salvarsanized serum injected into the spinal canal. Dr. Swift has used the cell-count, to which Dr. Brem did not refer, and has noticed after this method of treatment a diminished number of cells. We have been following out Dr. Swift's method at the Massachusetts General Hospital and have been impressed by the improvement in cases of tabes following the injection of the patient's own serum. After the patient has received salvarsan into his own blood, we bled him and 30 c.c. of his own serum are injected into the cord. The average dose, 30 c.c., given about once a week for a prolonged period, may strikingly ameliorate the condition of the spinal fluid, as found on puncture, and somewhat ameliorates the symptom.

It seems to me that the point which Dr. Brem has brought out, and which has been brought out by Dr. Dochez, is that we should make a spinal puncture in every case of syphilis.

DR. F. F. RUSSELL, Washington, D. C.: Dr. Brem has touched on one point, the examination of the cerebrospinal fluid in syphilis as a criterion of the cure of syphilis, and Dr. Cabot has just spoken of a standard of cure for syphilis. At present it seems to me that we might well talk about what shall be the standard of cure. We have four or five different tests to rely on, and it may be necessary to use them all; first, the length of time in which a man goes without symptoms; if a man goes without symptoms or a positive Wassermann, say for a year, that would be the first test; if at the end of that time he has a negative Wassermann, that is a second test; the third test would be a negative provocative Wassermann at the end of the year; the fourth test would be a negative luetin reaction. Dr. Brem and Dr. Cabot have proposed a negative cerebrospinal fluid, presumably at the end of the year. Thus we have five tests to be considered so that after a comparatively short time we can come to some agreement as to what shall be the standard of cure for syphilis.

DR. A. J. CAFFREY, Milwaukee, Wis.: Dr. Brem has had better results in fourteen cases of paresis than I have had in one case which I treated a few years ago. A man about 40 years of age gave a history of having had the initial lesion about seven years before. He had been treated at that time by a physician who later became paretic and is now in an insane hospital. He felt that his physician, who was insane, may not have cured him, and he had heard so much about salvarsan that he asked to have the treatment, which I gave him after having found a positive Wassermann. I gave the injection intramascularly because at that time we were not using the intravenous method. Before he had the first injection, he had a morbid horror of approaching tabes; the examination showed no significant signs of tabes, but he had all the characteristic symptoms of incipient paresis. After the injection of salvarsan his condition improved for about eight days, but he lapsed back again into his morbid dread of approaching locomotor ataxia. I gave him a second injection after two weeks, but he became uncontrollable as an office case, so I sent him to a sanatorium where he attempted suicide by stabbing himself in the abdomen. I took him to the hospital and found that he did no damage to the intestine, the instrument having gone down between the coils of the intestine and slightly penetrated the omentum. He recovered from the wound completely and was ready to leave the hospital, but one day after he ate his dinner he fell over dead. Necropsy was refused, but I have always believed that the salvarsan set up some reaction in the brain which caused a blood-vessel to rupture.

DR. JAMES S. MCLESTER, Birmingham, Ala.: In all cases of so-called parasyphilitic disease, my colleagues Dr. Ward and Dr. Toole, have followed the method of Swift. They first administer salvarsan intravenously, withdraw half an hour later a certain amount of blood and inject intraspinously 30 c.c. of serum so obtained. I cannot tell you their exact results, although I know in a general way that they are encouraging.

DR. WILLIAM LITTERER, Nashville, Tenn.: The examination of the spinal fluid by the Wassermann test should be made in every case of syphilis before we can say that this disease is cured. I am greatly impressed with the Swift method in the treatment of cases in which a negative blood with a positive spinal fluid is recorded. This is certainly the logical means of treating these cases, especially since we know that very little salvarsan ever gains entrance to the subarachnoid space. This is due to the fact that the spinal fluid is a secretion and not a definite transudation. I have had only four cases in which I tried the Wassermann test with the spinal fluid, and I found that in one case only by the giving of salvarsan was I able to obtain negative results. The lymphocytes were decreased in all of these four cases, but I could not obtain a complete negative Wassermann except in one case. The other cases are under observation at present.

DR. WALTER V. BREM, Los Angeles: In my paper I should have discussed Swift's work, but my time was limited and inadvertently I did not refer to it. Swift's method of treatment may prove to be the method of choice. It is somewhat difficult, but if necessary it can be carried out. I am rather hoping that my method of giving the larger doses may prove as effective as Swift's. If it does it will, of course, be much simpler and be available for a much larger number of cases. I doubt whether there will be more danger attending it than there might be from Swift's method. The cerebrospinal fluids in our cases were examined with reference to pressure cytology, the globulin content and the Wassermann test, and all of these reactions must be negative before we feel safe. Dr. Russell brought out the fact that the spinal fluid should be examined at intervals during at least one year following cessation of treatment, and probably longer. That is the plan I am following at present.

THE VALUE OF ABDOMINAL MEASUREMENTS IN PREGNANCY *

A STATISTICAL STUDY

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Since 1904 it has been customary for the assistants and students in my clinic at the San Francisco Maternity to measure the height of the fundus uteri above the symphysis in all cases of pregnancy. Measurements have been made with a tape-measure, placing one end on the upper border of the symphysis and the other on the ensiform cartilage. The uppermost margin of fundus of the uterus is located and read off the tape. In this paper, an effort will be made to estimate the value of these measurements in so far as they relate to the size of the unborn child and to the probable date for delivery.

Some years ago Ahlfeld[1] measured with a pelvimeter, the height of the fundus uteri in a series of cases and

* Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Ahlfeld, F.: Bestimmungen der Grösse und des Alters der Frucht vor der Geburt, Arch. f. Gynäk., bd. ii, 353, 1871.

concluded that from the twenty-fourth to the fortieth week the height of the fundus increased gradually from 15 cm. to 26.1 cm. He also made the valuable observation that while with the same measurement the weight of the babies varied, the length was very constant and was always twice the inter-uterine axis. But he did not associate these measurements with any rule for estimating the probable date for delivery.

Ahlfeld's work has been verified by Tramer,[2] Walraf,[3] Suttigen[4] and many others, but of late years so much attention has been given to estimating the size of the fetal head *in utero* by means of Muller's method of impression, or Stone's[5] modification of Perret's[6] method, that Ahlfeld's work has been neglected.

Suttigen[4] condemned the use of a tape-measure in measuring the fundus and stated very truly that the variations with a tape measure extended from 2 to as much as 13.5 cm. while with a pelvimeter, the variations were only from 2 to 5 cm. He observed that one of the chief causes for this variation was the contractions of the uterus. As the uterine contraction continues, the fundus rises higher and higher to subside at the end of the contraction to the original measurement. This is a very practical point and should always be taken into account in drawing conclusions from fundus measurements.

McDonald,[7] a few years ago, published a rule for estimating the period of pregnancy by measuring with a tape measure in a somewhat similar method to that which is described in the present paper but, unfortunately, his paper lacks statistical presentation and has overlooked the important point that as pregnancy

Height of Fundus	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	
	1800	3170	2060	2940	3038	3500	2890	3430	3650	3628	3560	3380	4070	3580	4600	3870	3970	
	1700	2860	3660	3220	2480	3580	3420	4400	3490	4540	3820	3300	3980	4240	4260	3900	3630	
	3180	2570	1450	3050	2125	3150	2910	3100	2870	4780	4550	4540	3640	Twins	3740	4535		
	1815	2120	3080	3795	2850	2880	2800	2375	3290	2900	3700	3480	3870	Twins	3460			
		1980	2940	2840	3520	3790	2440	3160	3520	2960	3560	3820	3900	Twins	3800			
		2100	3020	3740	2960	2500	3040	3240	4180	3120	3310	3510	4810					
			2325	2660	2680	3390	3120	3200	3400	3270	3520	3030	4000					
				2560	3225	3570	2610	2600	3450	3950	3470	3660	4535					
				3130	2720	3520	3240	2970	3700	3350	3330	Twins						
				3340	2220	3580	3320	3720	3400	3720	3720	3570						
				3180	3500	3110	3150	3010	3100	3900	3100	3685						
				2720	3350	3980	3700	3340	3720	3570	4380	3880						
				2380	2880	3540	3870	3600	2670	2960	3210	3960						
				2410	3160	3550	3180	3150	3050	3720	3380	3375						
				3090	2680	3190	3100	3340	3000	2840	Twins	4195						
Weight					2940	3290	3080	3440	3140	3175	3490	2860						
of					2580	2870	3130	3735	3270	3800	4340							
					2720	2800	3000	3710	2930	3515	3960							
Babies					3270	2680	3220	4000	3890	3175	3770							
					3005	3370	2920	2940	3560	3770	4110							
					3115	3140	3480	3470	3460	3460	3960							
					3400	2940	3530	3005	3200	3290	3655							
					3005	2400	2990	3515	3115	3715								
						3310	3600	3800	3630	3740								
						3210	3280	3275	3460	3935								
						3740	2140	3005	3460	3430								
						3030	3150	3400	2720	3770								
						3460	3490	3290	3460									
						3545	2835	3315	3115									
						2835	2720	3800	3570									
						3460	3630	3460	3345									
						3570	3175	2890	3740									
						3440	3430	4080	4140									
						2950	3880	2720	2720									
						3570	3145	3540	3540									
						3740	3545	3460	3630									
						3030	3260	2975	2890									
							3410	3960	3570									
							3175	3685	3175									
							3700	3230	4535									Total
Number of Cases	4	6	7	15	23	37	40	40	40	27	22	16	8	5	5	3	2	300
Average weight	2125	2455	2645	3005	2930	3275	3190	3360	3395	3555	3710	3620	4100	3910	3970	4100	3800	
Variation	1480	1190	2210	1415	1395	1580	1740	2025	1865	1940	1450	1730	1170	660	1140	665	340	

Chart 1.—Three hundred confinements. Height of fundus compared to weight of baby.

2. Tramer, D.: Ueber die Bestimmung der Grösse des Kindes vor der Geburt, Bern, 1881.

3. Walraf, J.: Ueber Längemessung der Frucht während des Geburtsactes, Berlin, 1873.

4. Suttigen, V.: The Means of Ascertaining the Length of Gestation by Measurements of the Fetus and Gravid Uterus during the Second Period of Pregnancy, Obst. Jour. Great Britain. London, 1875-76, iii, 397.

5. Stone, W. S.: Antepartum Measurements of the Fetal Head. Med. Rec., New York, Nov. 4, 1905, p. 725.

6. Perret: Bull. Soc. d'obst. de Paris, 1898, p. 58.

7. McDonald, E.: Mensuration of the Child in the Uterus with New Methods, THE JOURNAL A. M. A., Dec. 15, 1906, p. 1979; The Duration of Pregnancy with a New Rule for its Estimation, Am. Jour. Med. Sc., September, 1910.

advances the rate of uterine enlargement lessens. His rule is to divide the height of the fundus in centimeters by three and one-half in order to obtain the lunar month of pregnancy. About the same time I published a somewhat similar rule based on clinical observations, but also without statistical study. My rule was to add four to the height of the fundus as measured in centimeters, which would equal the probable week of pregnancy.

During the last five or six weeks of pregnancy it is surprising how closely both these rules will compare to Naegle's rule, but they both have the same basic error and are not accurate in the period from the twenty-fourth to the thirty-fourth week.

The literature is overburdened with many fantastic rules for estimating the weight of the unborn child such as that of A. Goenner, who stated that the weight of the unborn child could be estimated by measuring the foot, and such problems in mathematics as are presented by Roberts,[8] Tuttle,[9] etc.

Consequently, it is with many misgivings that the present statistical paper to estimate the value of uterine measurements is presented. Over two thousand records of confinement have been reviewed. On Chart 1 will be found the weights of babies taken immediately after delivery in a series of 300 labors where the height of the fundus and the degree of settling, or in other words, the total uterine axis was carefully observed. It will be noted that 157, or over half of the series, give fundus measurements between 34 and 37 cm. with average weights for the babies, between 3,275 and 3,395 gm. This might be considered a rough standard for average normal babies. Eighty-eight give fundus measurements between 38 and 45 cm., with average weights for the babies between 3,555 and 4,100 gm., besides five cases of twin delivery. This is a rough standard for over-maturity of the child. Fifty-five fundus measurements averaged betwen 2,125 and 2,930 gm. This also could roughly be stated as a standard of imperfectly matured babies. With experience, one can utilize these measurements to advantage in certain cases of toxemia, nephritis, heart-disease, etc., to determine the best period for the induction of premature labor or of the advisability of inducing labor at term; but unfortunately the possibility of error in exceptional cases precludes the utilization of these measurements in the management of contracted pelvis. It will be seen on the chart that with the same abdominal measurement, there is a variation in the weight of the child in exceptional cases of as much as 1 or 2 kilos. A great deal depends on the care with which the measurements are made, on the condition of contraction or relaxation of the uterus, on the skill of estimating the degree of settling and on the thickness of the abdominal walls, as well as the accuracy in diagnosing such conditions as hydramnios and multiple pregnancy.

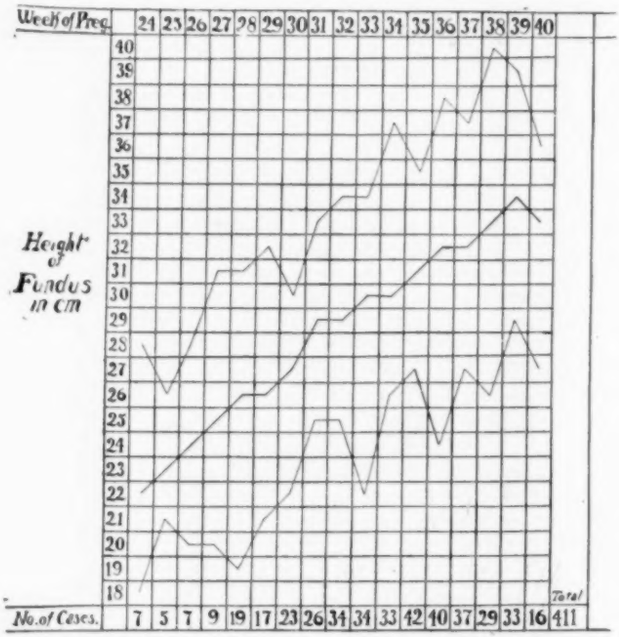


Chart 2.—Fundus measurements in series of 411 pregnancies. Upper and lower curves show limits of variations—middle curve shows average measurements.

Chart 2 presents the measurements of the uterus made at various weeks of pregnancy in a series of 411 patients. The patients in this series knew the date of their last menstrual period, gave birth to normal-weight babies within seven days of the expected time according to Naegle's rule and were not complicated with hydramnios or multiple pregnancy. The measurements begin with the twenty-fourth week of pregnancy and extend to the forty-first week. For each week the number of patients measured, which vary from five to forty-two, is stated on the charts. The upper and lower curves represent the greatest and the least measurements while the middle curve represents the average measurement obtained each week. The variations are the same that Suttigen noted and are due not only to personal equation, but to contractions in the uterus caused by manipulation of the fundus. I have tested this in personal cases and find that with a single examination these errors of variation are always possible, but with care and with repeated examinations at intervals, averages according to the middle curve are very constant.

Comparing these curves with the results obtained by Ahlfeld[1] and Suttigen[4] in a similar series of cases measured with a pelvimeter, it will be noticed that, even though the error of variation is less when measurements are made with a pelvimeter, the rate of increase noted from week to week is so small that no practical rule for estimating the period of pregnancy could be devised. In other words, measuring with a tape measure magnifies the results obtained with a pelvimeter (not only the errors but the averages as well) and permits of utilizing these measurements in a practical way.

In studying the curve of the averages, it will be noticed that there is a gradual increase in the height of the fundus from the twenty-fourth to the thirty-sixth week; after that, an irregular increase to the thirty-ninth week, and then a sudden drop to the forty-first week. The irregularity after the thirty-sixth week can be accounted for in the settling, which also causes some of the errors of variation noted throughout by the upper and lower curves.

Comparing the known week of pregnancy with the average measurements of the height of the fundus, it will be noted that between the twenty-fourth and twenty-eighth week or during the seventh month, the fundus measures 2 cm. less than the week of pregnancy; between the twenty-ninth and thirty-third week, or roughly the eighth month, the fundus measures 3 cm. less than the week of pregnancy; between the thirty-fourth and thirty-sixth week, or in the ninth month of pregnancy, the fundus measures 4 cm. less than the week of pregnancy;

8. Roberts, R. C.: The Uniform Lineal Growth of the Human Fetus, Lancet, London, Feb. 3, 1906, p. 295.
9. Tuttle, L.: The Relation Between Weight and Age in the Fetus, The Journal A. M. A., Sept. 9, 1908, p. 919.

and after the thirty-sixth week, or in the last month of pregnancy, the fundus measures 5 cm. less than the week of pregnancy.

Transposing these figures, it is easy to compute a rule for estimating an unknown week of pregnancy from the measurements of the height of the fundus. This has been done and has been found of considerable value, particularly in clinic patients, in whom so often no menstrual history can be obtained. The rule is: Measure with a tape measure the height of the fundus above the symphysis in centimeters, making allowance for settling when present, and add two to measurements between 22 and 26 cm., three to measurements between 26 and 30, four to measurements between 30 and 32 and five to measurements over 32, which sum will equal the probable week of pregnancy.

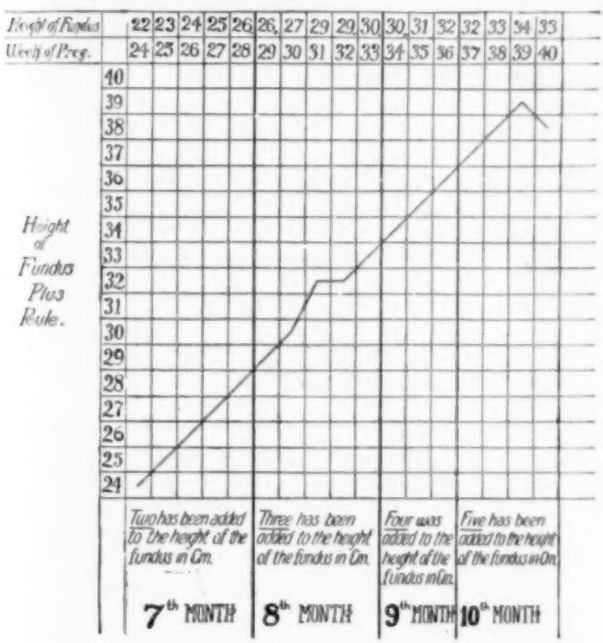

Height of Fundus
Week of Preg.
22 23 24 25 26 26 27 29 29 30 30 31 32 32 33 34 35
24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24
Height of Fundus Plus Rule.
Two has been added to the height of the fundus in Cm.
Three has been added to the height of the fundus in Cm.
Four was added to the height of the fundus in Cm.
Five has been added to the height of the fundus in Cm.
7th MONTH
8th MONTH
9th MONTH
10th MONTH

Chart 3.—Application of rule to measurements of Chart 2.

In Chart 3 the rule just stated has been applied to the measurements shown in Chart 2. It will be noted that with one exception, the estimated week of pregnancy corresponds exactly with the known week of pregnancy to the thirty-ninth week. It will be found that, with care, it is possible, as illustrated in this paper, to estimate accurately the probable week of pregnancy from the fundus measurements and in about three-fourths of all cases to estimate as closely as with Naegle's rule the date for the probable delivery.

CONCLUSIONS

Abdominal measurements are of value in estimating the degree of maturity of the unborn child. It is possible to estimate with considerable accuracy the probable week of pregnancy from accurate measurements taken with a tape measure of the height of the fundus above the symphysis.

Lane Hospital.

ABSTRACT OF DISCUSSION

DR. FREDERICK E. LEAVITT, St. Paul, Minn.: I have never accustomed myself to the use of the tape measure in the estimation of the size of the abdomen. I have depended rather on my own judgment and the estimate made from the manual examination. Dr. Spalding stated that in three-fourths of the cases it was possible in this way to estimate the date of labor correctly. From my own experience I think that I could strike it a little closer than that by estimating the probable date of labor from the date of the last menstruation. I do not see that there is any particular advantage in these abdominal measurements when we have accurate dates as to the last menstruation or the probable time of fertilization. The thing which interests me in abdominal measurements is to find out the proportions. The fetus is largely an unknown quantity, and in considering whether a patient is going to have a difficult or easy labor it is desirable to know how large the fetus is and whether or not it is out of proportion to the size of the mother. If the measurements indicated will help us, the idea is an advantage and of more importance than estimating the probable time of labor from dates. I have in mind several instances in which measurements of this kind would not have been of much value. In a family of two or three sisters and nieces there is a tendency to deliver short of full-term pregnancies. Some have gone thirty-four weeks, quite a number thirty-six, but none the full forty weeks. In these cases the measurements would not have helped to decide the date of labor.

DR. E. GUSTAV ZINKE, Cincinnati: A good obstetrician always regrets to accept a case of labor at, or just before, labor has begun. Some of the questions to be determined beforehand are: Is the patient pregnant? If pregnant, can she give birth to a child at full term? If so, what is the position of the child *in utero?* What is the general health and condition of the patient? And many other questions of great importance. Unfortunately, there are many who practice obstetrics who do not take the necessary care. It is this negligence which frequently gets both practitioner and patient into trouble. There is really no excuse on the part of the obstetrician, who is "engaged" long before labor, not to know the case before him and whether or not he will have a stormy time. Are the kidneys doing their duty? Are the emunctories of the body in perfect order? These queries bear significantly on the course and treatment of pregnancy and of labor. He who studies his cases carefully will not be taken by surprise.

DR. A. B. SPALDING, San Francisco: I think that we all realize how often women do not know the time of their last menstruation. I have seen a great number of charts which state that the labor is two months past the expected date for delivery. Again, when treating patients of a higher class — and the two classes that receive good service are the very poor and the rich — it will often be noticed that the pregnancy has run over the expected time for delivery. When pregnancy runs over, we should measure the height of the fundus as well as the pelvis. These measurements are of particular value in the class of patients who rest and eat too much. We have at our disposal good methods for the induction of labor at any time we desire, and that time should be when we think the child is large enough to survive and small enough to do the least injury to the mother's genital organs. In patients with habitual short-term pregnancies, we can measure the baby *in utero* and if we find that it is too small we can overfeed the mother and get it up to a normal weight. The operation for preventing prolapse of the uterus is of great interest to all of us. One of the best methods to prevent prolapse is to measure the abdomen every two or four weeks during the latter weeks of pregnancy, in order to know when the baby is fully developed and, at the same time, not so large as to cause serious injury to the woman's organs during labor, which will require subsequent serious surgical work or, more often, years of misery for the woman. It is the shame of obstetricians that so many of these cases go to the gynecologist afterward. There is no reason to my mind why patients should leave the hands of the obstetrician with damaged or diseased abdominal or genital organs if he does his work completely and properly. That is why I have presented this simple obstetrical paper. It is in the hope of encouraging enthusiasm for prophylactic gynecologic work rather than enthusiasm for repair work on women after years of misery due to poor obstetrics.

THE ESSENTIALS OF SANATORIUM TREATMENT OF TUBERCULOUS GRAVIDAE AND PUERPERAE AND THEIR CHILDREN *

CHARLES S. BACON, M.D.
CHICAGO

There are about 32,000 tuberculous women pregnant every year in the United States. Between 44,000 and 48,000 women of child-bearing age die of tuberculosis every year. Probably one-fourth of them are puerperae or have passed through pregnancy during the year, or, in other words, the gravidae and puerperae furnish one-fourth of all deaths from tuberculosis of women of child-bearing age. From this it also follows that about one-third of the pregnant tuberculous women die within a year of their labor. Of 10,000 children under 5 years of age who die of tuberculosis every year, three-fourths are born of tuberculous mothers.

These data show a part but not all of the bearing of pregnancy on the tuberculosis problem. Besides the increased loss of life among the tuberculous due to pregnancy, there is increase of infection both among the attendants, relatives and associates of the mothers and among the children. The gravidae and puerperae constitute an important factor in keeping alive the germ of tuberculosis and preventing the eradication of the disease. This factor has not been sufficiently recognized in the past, if we consider the means hitherto employed to combat it as an index of the general appreciation of the importance of the factor.

The proper management of the tuberculous gravida and puerpera and her child is that which carries the woman through labor and the lying-in period and leaves her from two to four months later in as good condition as she would have been in had she not been pregnant, and presents the child at that time to its parents and to society uninfected. This means considerably more than the ordinary care received by the average obstetric patient. It means a close watch of pregnancy, conservation of the strength of the patient and timely interference if necessary. It means the most skilful conduct of labor, through which the patient passes with no unnecessary loss of blood or of strength and with no risk of infection. It means a supervision of the puerperium to prevent as far as possible the exacerbation of the disease which is so common at this time. It means the separation of the child from the mother and caring for it as long as necessary. If the child is premature or feeble, incubation may be required at first. An incidental but very important feature of the management thus outlined is the education of the mother and her relatives.

We are of course considering only cases in which there is no therapeutic interruption of pregnancy. Possibly in 10 per cent. of all pregnancies in tuberculous women, or in 3,000 a year in the United States, therapeutic abortion is indicated. In the very great majority of cases, however, we must face the problem of a proper conduct of these patients through labor and the puerperium.

The obstetric management above outlined can be carried out in a private house only with considerable difficulty. It requires in the obstetrician peculiar skill, training and patient persistence. It demands likewise similar qualifications in the nurse. It is possible only among well-to-do patients who are sufficiently intelligent to agree to the regimen required. Probably not more than 10 per cent. of the 32,000 tuberculous gravidae found yearly in the United States could be ideally managed in their homes.

The labor can be conducted better in a maternity hospital or in the maternity department of a general hospital than in the home, but the conduct of the latter part of pregnancy and a long puerperium, which are at least as important as the conduct of labor, cannot be provided in such a hospital. Moreover, hospitals hesitate to admit patients infected with tuberculosis.

Hence comes the necessity for a maternity department in the tuberculosis sanatorium. We believe that three-fourths or even nine-tenths of all tuberculous gravidae should be cared for in such sanatoriums, and we insist that such care is necessary for at least one-third of these patients in order to protect them and society. This would mean that in the United States about 10,000 tuberculous gravidae should be sent to sanatoriums. To show the need of institutional treatment of the poor it might be stated that about eighty to one hundred pregnant women are included in the 8,500 patients who last year applied to the dispensary department of the Chicago Municipal Tuberculosis Sanatorium. All of these pregnant women should be cared for during the latter part of pregnancy and for some time after labor in a sanatorium.

Up to the present time there has been no provision made for these patients either in this country or in Europe. On the contrary, all institutions have practically excluded pregnant women. In the United States among the 30,000 to 40,000 hospital beds for consumptives not one is available.

This situation is probably due in part to the fact that hitherto this feature of the tuberculosis problem has not been emphasized, and in part to the supposed difficulty of providing a maternity department in connection with a general tuberculosis sanatorium. It is especially the object of this paper to call attention to the ease with which such a department could be provided. The essentials of sanatorium treatment are few and simple and not expensive. They can be provided in any large institution with little trouble and cost. Every state or municipal institution should certainly supply them, for the patients coming to these institutions are especially in need of sanatorium care. Many of these patients already have one or more small children. This is one of the great difficulties in securing proper sanatorium care for them. The mother cannot and will not leave her little children at home or elsewhere to the care of relatives or friends. Careful examination will show usually that the children are already infected. Any adequate solution of the problem must provide for these children.

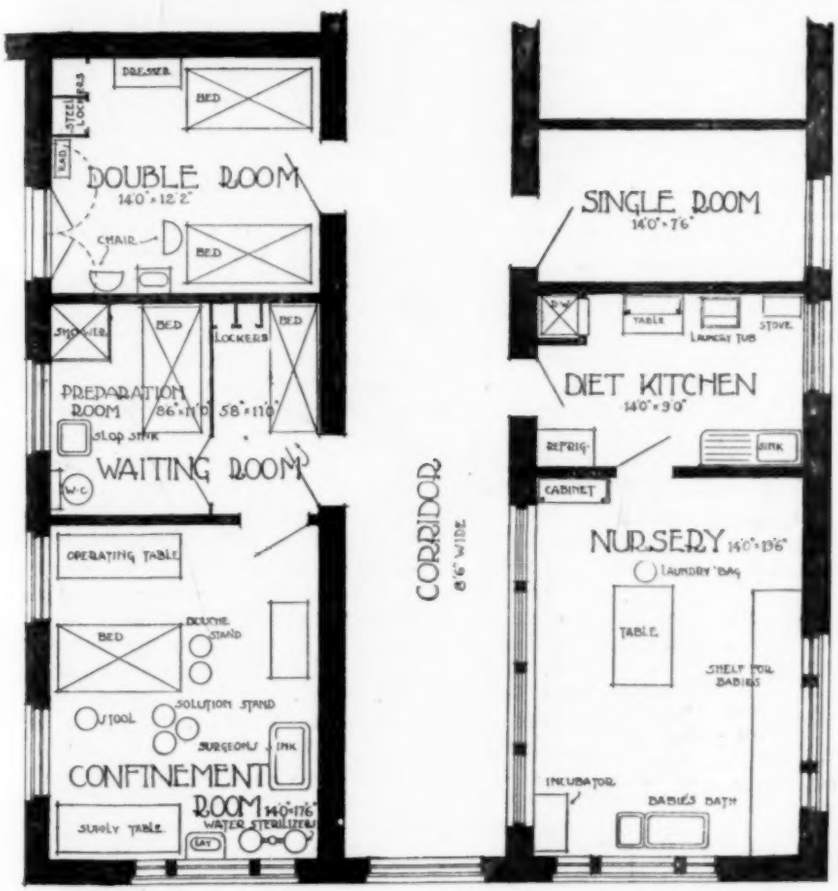
The Chicago Municipal Tuberculosis Sanatorium which is now under construction has provided an obstetric department that may be taken as an illustration of what can be accomplished without making any material change in the plans of the institution. This institution is located in the outskirts of the city on a half section of land and will provide for 850 patients. Through the center of the grounds extend the four main buildings, the administration building, dining rooms, the infirmary and the power-plant. On each side are located about twenty open-air cottages, those for the women being on the right hand or south side. The infirmary is a two-story building built in an H-shape, the south side being used for the women. In the infirmary are housed the patients that are unable to be around. In this infirmary is located the nursery and confinement room of the

* Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

maternity department, as well as the rooms for small children.

Before describing the arrangement further let us consider what is needed in the maternity department of a tuberculosis sanatorium. Five things will be required: (1) provision for gravidae; (2) a confinement room; (3) provision for puerperae; (4) a nursery; (5) a children's department.

Both gravidae and puerperae can be housed in the cottages or in the infirmary. If the pregnant women are able to walk around they can remain in a cottage near to the infirmary. The only especial provision required is, perhaps, that they be provided with an exercise place that is somewhat secluded, and this can be done by fencing off a section of the grounds with shrub-



Plan of maternity ward infirmary group. City of Chicago Municipal Tuberculosis Sanatorium.

bery. As soon as a puerpera is able to be around she may also go to a cottage.

The confinement and preparation rooms are like similar rooms in any hospital and are necessarily located in the infirmary.

The children's department, where the small children of the gravidae will be kept, is on the second floor of the infirmary above the obstetric department. There are rooms, wards and sun parlors in the porches so planned that the more serious cases can be separated from the light or doubtful infections.

The essential feature of the plan is the nursery. This should be on the sunny side of the building and should be well heated and ventilated. It should be separate from the mothers but located near them. It should provide at least 16 square feet of floor space, or 160 cubic feet of space, for each baby.

A study of the plan will show how these features are provided in the nursery of the Chicago institution. Two rooms, a nursery 14 by 20 feet and a nursery diet-room 14 by 9 feet, are located in the southwest corner of the women's part of the infirmary. To separate the babies from the mothers and yet keep them contented is the difficult problem. This is accomplished by having a glass partition between the corridor and the nursery so that the mothers can see their babies during the bathing or at any time.

The heating plant will furnish the nursery any degree of heat required. An incubator will be installed for premature or especially feeble babies.

In feeding the babies it is planned to utilize the mother's milk as much as possible. Inoculation and other bacteriologic tests of the milk will be made to determine whether the milk from a mother is free from tuberculosis germs or not. In case it is safe, and if the condition of the mother allows lactation, her milk will be obtained by hand milking or with a pump. This milk will be preserved in the diet room and fed to the child, supplemented by such artificial feeding as may be required.

This nursery will hold about eighteen babies, allowing each over 16 square feet of floor space and 176 cubic feet of space. Mothers and babies should be kept three months, and this would give a capacity of about seventy-two patients a year. If the mothers can be induced to remain only two months, as will probably be the case, the capacity of the nursery will be 108 a year. The capacity for gravidae and puerperae is unlimited, because any of the beds of the institution can be used by them. It is predicted that the applications for the first year or two will be about 100, or about one-eighth of the tuberculous gravidae of Chicago. Later, if the number increases, the nursery can be enlarged by using the adjoining rooms on the other side of the diet-room.

Eventually it may be desirable to erect a separate building for the maternity cases. The space provided in this pioneer plan, and also the equipment, is the minimum. Of course it is not pretended that an ideal nursery is provided. It is claimed that for the cost it is sufficient and eminently practical.

The accouchement room, with the adjacent preparation room and waiting-room, can be used not only for confinements, but also for induction of abortion when this operation is indicated. Other clean obstetric or surgical operations might also be made in this room in order to utilize it to its fullest extent.

In the hygienic and dietetic management of the pregnancy and the puerperium the same principles apply as in the management of any other tuberculous patient. Rest, massage, respiratory and general exercises, recreation, sleep, feeding, control of excretions, all must be

attended to. Good scales are an essential part of the equipment to enable us to control the progress of the cure and determine the effect of lactation in the puerperae. Of course the general laboratory of the institution will furnish the necessary laboratory examinations.

This preliminary announcement of the plans of the maternity department of the Chicago Municipal Tuberculosis Sanatorium is permitted by the trustees of the institution, all of whom have shown much interest in this new department. They have been prepared under the special direction of the president, Dr. Theodore B. Sachs, and of the architect, Mr. Otis.

This outline of the sanatorium management of tuberculous mothers and their children is given as a contribution to the solution of the problem, and to invite interest in it and stimulate discussion of the principles and details of the plan. Later we hope to be able to describe its workings and compare them with those of other institutions which may be incited to undertake similar work.

2156 Sedgwick Street.

ABSTRACT OF DISCUSSION

DR. WALTER J. MARCLEY, Minneapolis: We have here the possibility of the control of the tuberculous mother, the proper care of her lying-in period, prevention of tuberculosis in the young child, the sanatorium treatment of children from the home already infected and the education of the mother who will go back to her home. We know that it is more and more necessary to work with the children already infected. The details of the plan are to be worked out. Whether the child shall be fed on the milk of the tuberculous mother, whether the mother will be content to look through a glass window at her child, whether the mother would go into an institution and whether she would stay, are all details of the plan to be settled from the social point of view.

DR. MARY STRONG, Omaha: We do not believe in feeding babies on the milk of a tuberculous cow, why then should we ever feed a baby on the milk of a tuberculous woman? It seems to me that the latter is worse.

DR. CHARLES S. BACON, Chicago: I suppose it is known that the milk of the tuberculous cow becomes contaminated with the tubercle bacilli from the intestinal tract unless there is some tuberculous sore of the udder. It is possible that there may be infiltration of the germs through healthy milk-glands, but probably this is rare. This is a problem to be worked out and this as I have said can be done only by careful examinations, inoculations and other experiments.

SOME FEATURES OF ROENTGENOGRAPHIC CHANGES IN PITUITARY DISEASES*

ALFRED LUGER, M.D.
VIENNA, AUSTRIA

The studies of the function of the ductless glands enabled us to understand more fully many pathologic skeletal conditions until recently unexplainable. These conditions may reveal themselves either in disturbance of growth or in changes of configuration. In regard to the former we are familiar with the changes following disorders of the sexual organs, of the adrenal cortex and recently also of the pineal gland. Delayed skeletal development is exemplified in the well-known condition of hypothyroidism, a condition in which we find persistence or delayed closure of the epiphyseal lines and late appearance of the bone nuclei.

As illustrative of the changes in configuration the well-known condition of acromegaly affords us a good example. It is characterized by marked mandibular prognathism and enlargement of the hands and feet, accompanied by hypoplastic bony changes, especially to be noticed in the skull and here accompanied by enlargement of the sinuses. The pituitary body has for a long time been associated with these anomalies, and this early view has been confirmed by later investigation, although these studies have given us quite a different explanation for these relationships.

The great importance of roentgenoscopy in these conditions of pituitary disease is evident; for not only is the diagnosis often confirmed by the roentgenographic findings, but sometimes it is based primarily on them. Such an examination must be directed, first, toward the gland itself and its neighborhood, and secondly, toward the bony changes occurring in the skeleton in general as a result of the glandular disorder. The characteristic acromegalic findings are well known and will not be dwelt on in the following remarks, inasmuch as recent roentgenographic studies have not revealed any new features in the skeletal picture.

The changes in the cervicodorsal spine, previously described and recently referred to by some French authors, corresponding to the kyphosis so often observed in acromegalic conditions, are, however, interesting, although not generally known.

In view of the limited time at my disposal only two aspects of the roentgenographic studies of pituitary disease will be taken into consideration. First, the general changes in skeletal development heretofore referred to, and secondly, the changes in the skull and in the sella turcica, which are of great importance in relation to the differential diagnosis.

According to clinical experience the anterior lobe of the pituitary body seems to be the essential factor in the production of acromegalic manifestations which are believed to be the result of hyperfunction of this gland. No one has succeeded, however, in producing a similar condition experimentally by feeding or by transplantation. The manner in which this hyperfunction manifests itself does not seem to be dependent so much on the age of the individual as on the time of onset; that is, whether before or after the closure of the epiphyseal lines. If the latter have closed, acromegaly develops; if they are still open, simple gigantism without the specific acromegalic changes occurs. Numbers of instructive examples of such cases are to be found in the recent work of Cushing.[1] Of much interest also from the roentgenologic point of view are those cases in which at a comparatively early age the epiphyseal lines have closed and the subsequent hyperfunction of the hypophysis has produced real acromegalic changes. On the other hand, cases are reported which show only increase in stature in older individuals due to abnormally long persistence of the epiphyseal lines; but one must bear in mind that the rôle played by the pituitary gland in producing different types of gigantism, the normal and pathologic, has not been entirely explained.

In the majority of examples of the reverse condition, hypopituitarism, recorded in the literature, we find mentioned a lack of growth and delayed closure of the epiphyseal lines and a comparatively juvenile configuration of the skeleton without inclination to growth in height, a point of differential diagnostic value as contrasted with conditions dependent on changes in the

* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Cushing, Harvey: The Pituitary Body and its Disorders, Philadelphia, J. B. Lippincott Company, 1912.

sexual organs which will be mentioned later. Aside from the delayed closure of the epiphyseal lines we find also a delayed appearance of the bone nuclei, a finding which is said to be characteristic especially for the conditions before referred to (Falta). These cases are often combined with tardy sexual development and adiposity. There are, however, cases of pure infantilism without marked trophic changes, in which enlargement of the sella turcica has sometimes been found corresponding to a pathologic condition of the pituitary gland, an example of which we find in Cushing's book.

This hypofunction may be due either to a primary change in the gland or to secondary injury from a lesion in its neighborhood; and it is especially in this regard, namely, whether the pituitary symptoms are due to changes in the gland itself or are secondary to a tumor of its neighborhood that roentgenoscopy may give valuable information.

Before I speak about this important point in differential diagnosis, I should like to mention some variations in the sella turcica which may normally occur; for it is well known that in normal conditions the sella may show a marked variation in size and shape. A measurement of 15 mm. anteroposterior and 10 mm. vertical diameter is considered to be the limit in size to which it may normally attain; but in considering the size of the sella it is necessary to take into account the condition of the other ductless glands, especially of the sexual organs, which are known to have a definite correlation with the pituitary gland. It is known that castration produces hyperplasia of the pituitary gland and secondary enlargement of the sella turcica (Tandler and Gross), as opposed to the findings in the so-called "eunuchoid type," in which no enlargement of the sella turcica has been observed, in spite of the many resemblances to the true eunuchs in their somatic appearance.

Concerning the female sexual organs, undoubted changes in the hypophysis during pregnancy have been observed and enlargement of the sella turcica on roentgenoscopy has also been reported; indeed, in older multiparous women we find rather often a comparatively large sella, a finding possibly due to ovarian insufficiency. One should be cautious in making a diagnosis of pituitary tumor in these persons in the absence of clinical tumor symptoms. It seems possible, however, that pituitary hyperplasia secondary to insufficiency of one of the remaining ductless glands could produce true acromegalic changes, as suggested by a case of acromegaly following castration in an adult woman (Goldstein).

Furthermore, the condition of the thyroid gland must be taken into consideration, for in many cases of myxedema enlargement of the sella turcica can be demonstrated roentgenologically.

The two commonest variations—the short and rather deep, and the long and rather flat types of sella—seem to be dependent in some way on the shape of the base of the skull (Schüller). The first type we find, as a rule, in brachycephalic persons, the second in those who are bradycephalic.

Another interesting correlation has been noted by Fitzgerald, who asserts that the size of the sella always corresponds to the length of the posterior portion of the base of the skull, but that it is in indirect proportion to the distance from its anterior wall to the ethmoidal spine. The size of the sphenoidal cells seems also to bear an important relation to the configuration of the sella turcica. Although we have as yet no certain knowledge concerning these things, we frequently find a small sella in association with a massive sphenoidal bone or with poorly developed sphenoidal cells, aside from the acromegalic cases in which the enlargement of the sinuses belongs to the characteristic syndrome.

The anatomic relations of the sella turcica are the more important because we cannot see the gland itself on the roentgenogram. In spite of the cases occasionally reported, it is important to know that the shadow of neither the normal nor the pathologically enlarged gland can be seen on the plate, except in the rare cases in which calcification has taken place, a condition more often found in the so-called *Hypophysenganggeschwülsten* (Erdheim) and roentgenologically described in a single instance by Algyogy. Recently I have observed three further cases in Dr. Cushing's clinic which seem to belong in the same group, a report of which will be given in greater detail at a later time.

In general, however, it may be said that conclusions in regard to disorders of the gland itself can be drawn only from the changes in the bony parts. These changes in the sella turcica are represented by its enlargement, by a thinning of the floor and by a thinning and absorption of more or less of the dorsum and of the posterior clinoid processes.

It is now interesting and of great importance to note, as it has been shown by Erdheim and Schüller that the order of appearance of these changes in the sella turcica is quite different in the case of a tumor of the pituitary gland itself—the so-called intrasellar tumor, on the one hand, and tumor of the hypophyseal stalk, or other pathologic condition, of the immediate neighborhood of the gland, on the other hand. In intrasellar tumors we find first an enlargement in the site of the sella, with increasing thinning of its floor and of the dorsum sellae, followed later by more or less pronounced absorption of the posterior clinoid processes and of the dorsum sellae. This thinning of the floor and of the dorsum may finally cause a disappearance of the normal border, so that after a time we may find on the roentgenogram only very faint lines—the remains of the dorsum sellae.

Quite different is the sequence of changes in the other types of tumor mentioned. Here the absorption of the clinoid processes and of the dorsum sellae is first noticed, and although later we find an enlargement of the sella, nevertheless this enlargement is rarely so pronounced as in the case of an intrasellar tumor; and the sella is always of the characteristic flat type, as compared with the deep and round sella of an intrasellar tumor. It is evident that in a later stage of development in these two types it would be difficult or quite impossible to make a differential diagnosis.

Furthermore, in tumors of the brain which have no topographic relation whatsoever to the pituitary gland and in the case of internal hydrocephalus, we find not infrequently changes due to the increase of intracranial pressure, and very similar to those heretofore mentioned in connection with extrasellar tumors. In these cases the differential diagnosis can be made only from the clinical symptoms and the other Roentgen-ray findings in the skull, for tumors of the hypophysis in their early stage only exceptionally show signs of increased intracranial pressure on the roentgenogram. Tumors of the brain, on the other hand, often produce even at this time an enlargement of the diploetic veins and deepening of the pacchionian grooves and of the furrows corresponding to the convolutions of the brain. The differential diagnosis can often be made by the secondary changes of the skull and by a lack of the typical

acromegalic changes, such as a thickening of the bone, enlargement of the sinuses, mandibular prognathism, etc.

Especial attention should be called, according to Schüller, to the development of the so-called sphenoparietal sinus—a venous channel connecting the sinus cavernosus with the convexity of the skull. In big tumors of the sella this sinus is often enlarged, which can be explained by pressure of the growth on the sinus cavernosus. In normal persons, however, one must remember that a large sphenoparietal sinus is occasionally to be found; so that this condition must always be interpreted with a certain amount of caution.

In tumors of the acoustic nerve, a rather characteristic change in the dorsum sellae has been observed. These tumors sometimes produce not only a thinning of the dorsum sellae, as in other extrasellar growths, but also a rather characteristic tendency of the dorsum sellae to incline forward. This fact enables us at times to make a diagnosis of an acoustic tumor from the roentgenogram, especially when these changes of the sella are combined with the described enlargement of the meatus acusticus (Henschen).

All these examples show that changes of the sella turcica in size and shape occur rather frequently in conditions other than true pituitary tumors; that is, in tumors in the neighborhood of the sella turcica as well as in tumors without any topographic relationship to the hypophysis and in cases of increased intracranial pressure due to internal hydrocephalus. On the other hand, the great influence of the other ductless glands on the development of the pituitary gland and on the secondary changes of the sella turcica has been demonstrated. These facts prove that not every change in the sella turcica is necessarily to be interpreted as a result of a primary pituitary disease, a fact which I hope I have emphasized especially in these brief remarks.

A COMPARATIVE STUDY OF ANTIGENS FOR THE WASSERMANN REACTION *

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HISTORICAL REVIEW

In 1901, Bordet and Gengou published the method for complement fixation, which was designed for the purpose of detecting antigens; that is, such bodies as are capable of producing antibodies, as well as a definite group of serum substances, probably amboceptors, the nature of which is not yet determined. It is possible by this method to determine, by the use of a known antigen, whether a certain serum contains the specific amboceptor, or reversely, one may determine by means of a known serum whether the substance used as antigen contains the antigen bodies. Neisser and Sachs proposed the use of this method for the differentiation of albumin. Wassermann, Neisser and Brück were able to demonstrate, in the serum of monkeys which had been previously treated with extracts of syphilitic organs, the presence of substances which gave complement fixation with syphilitic extracts. Detre, as well as Wassermann, Neisser, Brück and Schucht, found the same substances in the serum of syphilitic patients. Their early experiments, however, gave very inconsistent results. Citron was the first to recognize that the amounts of antigen and serum employed by the former authors had been too small and that the influence of the specific medication on the reaction was unknown to them.

Porges and Meier, von Landsteiner, Müller and Pötzl and later Yamanouchi and others pointed out independently that a substance could be obtained by extracting syphilitic and normal human liver as well as other organs with alcohol, which, when mixed with the serum of syphilitics, gave rise to complement fixation, and which to a certain degree could replace the syphilitic antigen. Porges and Meier, as well as Landsteiner, incline to the view that the alcohol-soluble substance is a lipoid closely related to lecithin, while Levaditi and Yamanouchi ascribe less significance to the lecithin and consider the bile salts as the important substances. The complement-fixation tests carried on by Wassermann and Citron with various colloidal substances such as glycogen, albumoses, peptone, lecithin, oil and gelatin, as well as the experiments of Landsteiner and Stanovic with other colloids, led Citron and Wassermann to the assumption that the cause of the complement fixation is a chemicophysical change of the molecule due to its entering into combination with some other substance. The experiments of Seligmann also prove that in colloidal reaction with or without precipitation complement may be absorbed. The disappearance of the complement is not due to the molecular condition as such, but is due to the changed condition of the colloids. While this does not offer any explanation of the specific immunity reaction, it shows that aside from the immunity reaction there coexist other definite chemical reactions which cause the disappearance of the complement. This in no way alters the great value of the complement-fixation test for the biologic diagnosis of infectious diseases, for it is the special property of immune serums to influence to a greater degree that colloid which is their antigen.

These findings induced Wassermann to separate the complement fixation in syphilis from the generally accepted antigen-antibody hypothesis for other infectious diseases, for he assumed that all antigens must be albumins or derivatives of albumins, without considering that some lipoids or lipoid-albumin combinations might be antigens also. The experiments of Metchnikoff and those of Deyke Pasha and Reschad Bey point to the fact that it is possible to stimulate the organism to the formation of reacting agents, similar to antibodies, by the injection of fat-like substances. The cobra-lecithin experiments should also be mentioned in this connection. It was pointed out by Citron that the injection of animal and other poisons with lecithin causes the formation of toxolipoids which may act as antigen, that is, produce antibodies. Such antibodies against the syphilitic toxolipoids may have a lipoidophil group which is brought out in the admixture with lecithin.

The fact that the serums of luetic patients are rich in ferments capable of splitting certain fats and lipoids and the presence of such ferments to a lesser degree in the serums of patients suffering from other infectious diseases, such as leprosy, tuberculosis, scarlet fever, etc., may be the reason why such serums react with syphilitic antigen. Thus it is possible that in the Wassermann reaction we are dealing with several distinct complement-fixation reactions of entirely different character, one of which may be specific.

In spite of the fact that the Wassermann reaction is as yet unexplained, it is widely used for the diagnosis of syphilis. The aqueous extracts of the syphilitic liver

* Read in the Section on Dermatology of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

and spleen were, on account of their instability, displaced by alcoholic extracts of these syphilitic organs. The difficulty of obtaining syphilitic fetal tissue also had its influence in stimulating the search for some substitute as antigen. More recently acetone has been employed as extractive, because it is supposed that such extracts contain substances which approximate the syphilitic antigen more closely, and thus permit of a more delicate reading of the test. It does not fall within the scope of this paper to review the extensive literature dealing with the various antigens employed by the experimenters in this field of research. The extracts employed have been either specific, such as were obtained from syphilitic tissues by the use of water, alcohol, or acetone as extractives, or they have been non-specific extracts made from heart muscle, liver and brain of guinea-pigs and cattle. Aside from these extracts, combinations of chemical substances, such as Schurmann's and those given by Sachs and Rondim, have been employed as antigens in this reaction. From this it appears that normal tissue contains substances, possibly to a lesser degree, as has been shown by Much, which have the power to absorb the complement.

Aside from the use of artificial antigens, there have been other modifications of the Wassermann reaction; however, none of these modifications have as yet increased the clinical value of the test, nor has any attempt to simplify the method been suggested which does not at the same time sacrifice considerably its accuracy.

In the course of the inoculation experiments of four strains of the *Spirochaeta pallida*, which have been carried on in rabbits at the Research Laboratory of Parke, Davis & Co., it seemed that the white, glistening gumma, which contains practically nothing but spirochetes and the products of their metabolism, might offer material for the preparation of antigen for the Wassermann reaction which would possess more of the specific antigen bodies than any other antigen yet used for such purposes. The antigen thus prepared was made from lesions caused by the four strains of the organisms. We had, therefore, a specific and to some degree polyvalent antigen. The four strains of *pallida* have been transplanted now for over a year, and the lesions which these organisms produce are free from secondary infection. No antigen was prepared from cultures of the organism, since the culture does not afford a sufficient amount nor could the mediums in which the *pallidae* were growing be separated from them. It seemed that the extract of organisms and culture mediums would afford us no more specific antigen than had been employed by others thus far. The syphilitic gumma frequently replacing one half and more of the testis seemed better suited for this purpose, since all the non-infected tissue could be trimmed away, and only the grayish-white gumma used. The term "gumma" is here used not in its strictest sense. The lesion produced by the action of the *pallida* in the gland proper is one of clearly circumscribed mucoid degeneration. Superficial chancres were not employed since these are usually contaminated with other bacteria.

The antigens were prepared as follows: The lesions were carefully freed from the tissue not involved, ground up fine and weighed. The material was then frozen in an ice and salt mixture, and dried *in vacuo* over sulphuric acid. When completely dry, it was placed in physiologic salt solution to which 0.3 per cent. trikresol had been added. The ratio of tissue to salt solution is 1:4. This tissue suspension was shaken for twenty-four hours and placed in a sterile amber glass bottle in the refrigerator for three days to allow the tissue to settle. This was our aqueous antigen.

The alcoholic antigen was prepared in the same way that the regular stock syphilitic fetal liver antigen is prepared.

The acetone extract was prepared by placing the ground-up and dried tissue into Merck's C. P. acetone, taking for every gram of tissue 20 c.c. of acetone. This was allowed to stand in a dark bottle at room temperature for eight days, filtered and evaporated at 37 C. (98.6 F.).

The residue was taken up with C. P. methyl alcohol, one hundred parts of the methyl alcohol being used for every gram of residue. The acetone residue contains a substance which is not soluble in methyl alcohol. The methyl-alcohol-soluble extract is admixed with ten times its volume of physiologic salt solution for the test.

These three extracts of gumma of rabbits were tested against the alcoholic extracts of syphilitic fetal liver, and in our last experiments, the acetone-insoluble portion of beef heart.

Practically every antigen has the power to bind some complement. And the reason for the diversity of results obtained by some investigators on one and the same

Fig. 1.—Syphilitic gumma of testis of rabbit from which antigen was prepared.

serum does not lie so much in the method employed as in the proper titration of the extract employed as antigen.

The value of a certain extract is usually determined by a preliminary experiment, usually according to Wassermann, in which a unit of the antigen gives complete fixation when admixed with a unit of luetic serum, while normal serums give a negative reaction. Any antigen fulfilling these requirements is considered satisfactory for this reaction.

If increasing doses of an antigen are tested for their activity in the seroreaction in syphilis, then it is shown that very small amounts will not bind the complement even in cases of florid syphilis. As the dose of the extract is increased, the fixation of the complement occurs with greater frequency, so that serums of latent syphilitics also react. If the amount is increased still more, the serums of patients not syphilitic will give positive reactions. And if the dose of the extract is carried still higher, we find that serums of normal healthy individuals give the reaction. The amount of antigen is then able to bind all the complement. It thus becomes evident that only such amounts of antigen should be employed in syphilis as will bind the complement only with luetic serums. Thus the Wassermann reaction is specific only within certain limits of the doses of anti-

gen. For this reason the extracts were tested for their power to bind complement.

Increasing amounts of the extract are placed with the amount of complement usually employed in the sero-reaction in the incubator, then amboceptor and sheep blood corpuscles are added. For the test only one-half of that amount is used, which clearly indicates fixation (*Eigenhemmung*).

DETERMINATION OF THE SENSITIVENESS

In the serodiagnosis of syphilis, it is not so much a question of obtaining fixation of complement with undoubted cases of syphilis, as of determining a fixation of complement in the doubtful cases, which determine for or against syphilis. Complete binding of the complement is practically uniform with all extracts, but the cases demanding especial attention are those which show only partial complement fixation. Such cases may be overlooked by an observer who does not work with a sensitive antigen, for which reason it is not advisable to take the serum giving a strongly luetic reaction, for a positive control, but one which lies on the border-line, that is, serums that give a weak positive reaction, such as latent luetics, and those having sclerosis. Such serums are tested with varying amounts of extract according to the usual method, beginning with minute dilutions of antigen to the largest permissible.

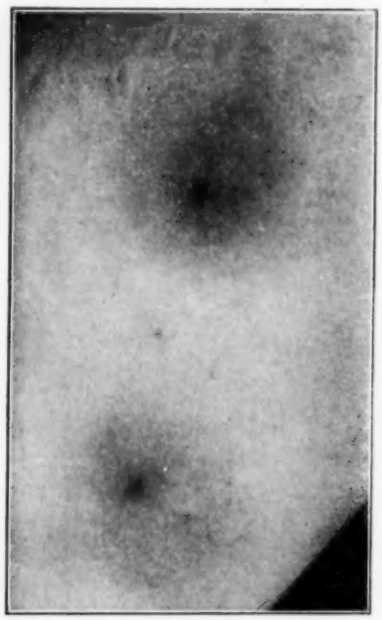

Fig. 2.—Luetin reaction obtained from gumma in rabbits used for the preparation of antigen. Control in center.

DETERMINATION OF THE SPECIFICITY

It is evident that for this purpose not only serums of normal individuals should be employed, but also serums which, from experience, at times give a positive Wassermann reaction. It has already been pointed out that in such cases we may not be dealing with the same biologic process which takes place in the serum of a luetic, but with a non-specific process which simulates the specific reaction in syphilis. Many serums from cases of various general diseases contain substances which inhibit hemolysis. If to such serums antigen is added which also contains bodies capable of binding complement, we are able to observe a summation of these two binding substances which absorb all the complement.

The specificity of the antigen used was determined by the luetin reaction, in so far as this reaction may be called specific. Extract of the gumma gave positive reaction in tertiary cases of this disease.

These comparisons of the antigens of gumma cover only the preliminary stages of the work we have begun. The antigens prepared from the several strains of the spirochetes are more active and for this reason had to be diluted from ten to twenty times more than the ordinary antigens prepared from syphilitic fetal organs or normal tissues. This high dilution of the antigen minimizes the physical influence, which strong alcoholic antigens exert on the serums to be tested. The antigens when admixed with physiologic salt solution were practically clear, differing in this respect from other antigens which in dilution show milky white turbidity. Another difference noticed between the rabbit gumma antigen and other antigens is the more delicate reading of the results of the reaction. The cases of doubtful clinical diagnosis are more clearly brought out by these antigens.

The sensitiveness of these antigens to luetic serums led us to test them against serums from leprosy and scarlet fever. Through the kindness of Dr. Guy L. Kiefer, health officer of Detroit, we were able to obtain serums from scarlet fever patients while the disease was in its eruptive stage and at different periods following this stage. The leprosy serums included were obtained through the courtesy of Dr. James MacFarlane Winfield of Brooklyn, to whom we desire to express our thanks.

The syphilitic lesions in rabbits permitted us to obtain antigens which to a degree are more specific than the antigens generally employed, since these gumma contain the spirochetes in large numbers free from contamination. At the same time we were reasonably certain that our antigens were free from the bile salts which possibly are present in the antigens made from fetal syphilitic livers.

The fact that Schwartz and McNeil were able to improve the fixation of complement in gonorrhea by combining twelve strains of the gonococci of their antigen led us to combine the four strains of the *pallida* for the antigens we employed. By so doing, we increased the efficiency of the antigens. The reaction was negative, however, in the serums of patients having just passed the eruptive stage. The serums of leprosy patients were also positive, yet to a less degree than the luetic controls. How far this reaction is due to the leprosy per se, it was impossible for us to determine.

SUMMARY AND CONCLUSIONS

1. The use of syphilitic gumma in the testis of rabbits yields a more specific antigen than any obtained from other syphilitic or normal tissue.

2. The combination of a number of strains, giving a polyvalent antigen, increased the value of the antigen, permitting the diagnosis of clinically doubtful cases.

3. Aqueous antigens lose their strength in about one month while those prepared with acetone and alcohol are stable.

From our data, we incline to the view that in the Wassermann reaction of syphilis, we may be dealing with three distinct reactions. First, we deal with the antibodies produced against the causative organism—if such antibodies are produced; next, we are dealing with substances, possibly antibodies, directed against bacterial lipoids, and, finally, with a group of substances, autolytic in nature, which the tissues of the body evolve against the toxic substances resulting from the influence of the *Spirochaeta pallida* on the tissues.

Washington Arcade.

ABSTRACT OF DISCUSSION

DR. HOWARD FOX, New York: The antigen is the all important factor in the Wassermann reaction, but the attempts that have thus far been made to standardize our preparations have not been particularly successful. It would be a great step in advance if we could find a standard antigen which every one could use, as in that way there would

be fewer divergent results from different laboratories. During the past year I have used the alcoholic extract of normal heart, titrating the complement and using decreasing amounts of the serum of the patient. By this method I have obtained better results than I did formerly with the alcoholic extract of fetal liver.

DR. J. FRANK WAUGH, Chicago: There is one other antigen which I do not think has been mentioned. Noguchi has done a great deal of work on the serodiagnosis of syphilis, and in one of his articles on the subject he mentions an insoluble acetone antigen. Dr. Harris gave me some soluble acetone antigen, and on testing it, I found it very efficient. The acetone extract gives a stronger reaction in some cases than the alcoholic extract. In the last year I have tried and compared both the alcoholic and the aqueous extracts with the acetone extract and have found the latter just as efficient. I agree with Dr. Fox regarding the importance of a strong, standard antigen.

In the *Deutsche medizinische Wochenschrift* (Dec. 5, 1912), O. Stiner reported his experiences with the use of acetone extracts. He reports that in some cases of positive lues, in which alcoholic extracts gave negative results, positive reactions are secured with an acetone-liver extract.

DR. M. L. HEIDINGSFELD, Cincinnati: I take exception to Dr. Varney's statement that the gonococcus complement-fixation test is more reliable than the Wassermann, in order to spare the Wassermann too much undeserved disrepute. Theoretically, the gonococcus test should be more reliable than the Wassermann, but experience has shown that the Wassermann is far the more reliable of the two. The Wassermann never errs on the unsafe side, and is a reliable procedure if the details are carefully and properly carried out. As Wassermann has pointed out, there is a fundamental reason for every step of the reaction. Some of the modifications may be more delicate, but they are at the same time the less reliable.

DR. RUDOLPH BUHMAN, St. Louis: Did Drs. Varney and Baeslack use a watery or an alcoholic preparation as an antigen?

DR. H. R. VARNEY, Detroit: I thoroughly agree with Dr. Fox that what we are searching for is a standard antigen, and that when it is found we shall have more uniform laboratory reports. Regarding the preparation of the antigen, the aqueous, acetone and alcoholic were used and checked up in series.

Regarding my estimate of the comparative accuracy of the Wassermann and the gonococcus fixation tests, which Dr. Heidingsfeld criticized, I would say that, so far as I have been able to follow the laboratory records, I am able to assert that by the fixation test it is possible to pick out the diplococcus of Neisser from a large family of similar organisms, which is proved clinically, while with the Wassermann test we cannot with our present knowledge positively exclude other diseases, as tuberculosis, scarlet fever or leprosy.

DR. F. W. BAESLACK, Detroit: The delicacy of the test depends largely on the titration of the antigen. We may titrate for its delicacy and sensitiveness, and it is only when tested against weak syphilitic cases that a real idea of the value of the antigen is obtained. It is in the careful titration of the antigen that the secret lies, and what we are searching for is a reliable antigen.

Suggestion and Disease.—It is undoubtedly true that a serene spirit is a valuable agency in the recovery from disease. It is likewise true that suggestion has a mighty potency when it is rightly applied. It is a legitimate and recognized branch of therapeutics, which may be destined to have a wide application in the future treatment of disorders of the nervous system. But it is likewise true that suggestion heals no broken bones, a spirit unperturbed gives no safeguard against poisoned mosquitoes, and the power of the will and the imagination is potent chiefly against disorders of the imagination and the will.—David Starr Jordan, *Science*.

CLINICAL OBSERVATIONS ON THE EMETIC ACTION OF DIGITALIS*

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Nausea and vomiting are probably the commonest of the side-actions encountered in the clinical use of the digitalis bodies. They have generally been attributed to a local irritant action of these substances on the mucous membrane of the alimentary canal. In two previous papers[1] Dr. Hatcher and I have shown that the digitalis bodies cause nausea and emesis in animals through their direct action on the vomiting center in the medulla. We have been unable to find in the literature, or to adduce from our own experiments, any evidence either to controvert this statement or to support the opposite view of local irritant action in the stomach or intestine. In view of our experimental findings we called attention to the need for a carefully controlled series of observations on the seat of the emetic action of therapeutic doses of this group of drugs when used clinically. It is the purpose of the present paper to set forth the results of such a series of observations, together with a review of several series of cases reported in the literature in other connections, and to correlate the clinical and experimental data as far as possible.

Fifteen cases of cardiac valvular disease were studied in the wards of Bellevue and New York Hospitals.[2] In all but one of the cases the clinical observations were supplemented by the use of the polygraph. None of the patients received other medication which might in any way influence the actions of the digitalis, except Nos. 4 and 6, who received tincture of nux vomica, and Nos. 6, 10 and 13, who were given atropin, with a view to studying the modifying effects of these drugs. A brief summary of each case follows, fibrillating and non-fibrillating cases being considered separately.

In the summaries, and in all of the tables, the expression "clinical improvement" is used for brevity, and by it is meant clinical evidence of definite improvement in those symptoms referable to impaired cardiac action.

CASE 4.—B. H., No. D. 2, 417. Woman, aged 65. After taking 1.6 gm. of digitalis in the form of tincture, m. x, q. 4 h., vomiting began. Tracings showed slowing and coupled rhythm. Marked clinical improvement preceded the vomiting. The digitalis was continued together with m. x of tict. nux vomica, but the vomiting continued and both drugs were stopped. After an interval of five days tinct. digitalis was given again, m. xx, q. 4 h., until 0.6 gm. of leaf had been taken when vomiting, slowing of pulse, and coupled rhythm returned.

Tables 1 and 2 present these case records more concisely.

Eleven patients, ranging in age from 15 to 65 years and all suffering from auricular fibrillation, developed either nausea alone, or nausea and vomiting, is a result of taking digitalis. The shortest time from the begin-

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* To save space this paper has been abridged by the omission of case reports, except one typical case (Case 4), and the illustrations. The complete paper will appear in the Transactions of the Section and in the author's reprints.

* From the Laboratory of Pharmacology, Cornell University Medical College.

* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Eggleston, Cary, and Hatcher, R. A.: The Emetic Action of the Digitalis Bodies, Jour. Pharm. and Exper. Therap., November, 1912; The Emetic Action of the Digitalis Bodies, THE JOURNAL A. M. A., Feb. 15, 1913, p. 499.

2. I have to thank the several visiting physicians, Drs. William Gilman Thompson, Warren Coleman, F. S. Mearn, Lewis A. Conner, and William R. Williams for the privilege of making these observations.

ning of digitalis administration to the appearance of nausea or vomiting was about two days, in Case 7 the patient having taken 2 gm. of the leaf in this period. The longest interval was seven days, in Cases 1 and 8, in both of which it will be noticed that the effect of the drug on the heart was relatively less marked than the average. The average time elapsing from the beginning of digitalis treatment to the onset of nausea or vomiting was five days. The smallest dose causing nausea or vomiting in the first course of treatment was 1.6 gm., the largest 6.25 gm., and the average for the eleven cases was 3.08 gm., corresponding to about 73/4 drams of the tincture.

Five of the patients received a second course of digitalis from which nausea or vomiting also resulted, and in each case the total quantity of digitalis required to cause these symptoms was less in the second course than in the first. Except in Case 3, in which there was an interval of sixty days between courses, and possibly also in Case 2, in which the interval was twenty-four days, the smaller second course is attributable to the persistence of action of the drug from the former course.

Some of the patients had complained of nausea and vomiting when admitted to the hospital, and one or two vomited a few times within the first few hours, but in no case did these symptoms persist after the first twenty-four hours of treatment with digitalis, which in itself is evidence of an improvement in the heart action with a diminution of congestion resulting from absorption of the drug. Such an observation shows, further, that the digitalis given did not cause vomiting by irritation of the gastric mucosa, even in these cases in which this was rendered abnormally irritable through congestion.

Tincture of nux vomica has been said to prevent the vomiting resulting from digitalis if given along with it, but this was not the case with Patients 4 and 6 in this series.

In the four cases with regular rhythm, the signs of the action of the drug on the heart at the time of the nausea or vomiting were none the less definite, though, in general, they were not so striking as in the case of those patients whose hearts were in a state of fibrillation. This is in accordance with the almost universal observation that the rate and rhythm of the heart under the control of the normal pace-maker is less easily and less markedly affected than is the case when the normal pace-maker is not in control.

The average emetic dose in this series was 2.4 gm. (first course). The average time from the beginning of treatment to the appearance of nausea or emesis was seven days as compared with five in the previous series, the difference being due in great measure to the fact that less digitalis was given per day than in the first series. Cases 12 and 13 show "cumulation" of the drug, as regards both emetic and cardiac actions.

In none of these fifteen cases did the nausea or vomiting bear any constant time relation to the administration of the dose of digitalis, and in most cases nausea or vomiting persisted or recurred for some hours after the last dose had been given and the drug withdrawn.

To supplement my personal observations I have collected all of the cases reported in *Heart* from its first number to, and including, the latest issue at the time of writing (Volume IV, No. 2) in which sufficiently detailed accounts are available for me to determine the relation of the nausea or vomiting to the effect of the

TABLE 1.—CASES OF AURICULAR FIBRILLATION

Case	Digitalis	Am't. Dig. at N. or V. in gm. of leaf	Pulse at beginning of Digitalis	Nausea or Vomiting	Pulse at Time of N. or V.	Effects of Digitalis at Time of N. or V. with Reference to Action on Heart
1	Inf. oz. ½ q. 4. h.	6.25	88	V.	70	Slowing; c-r;* cl. imp.* See Note 1 below
	Inf. oz. ½ q. 4. h.	1.60	78, 84, 56, 88	V.	56, 44, 56, 44	Slowing; c-r; cl. imp. See Note 2 below
2	Inf. oz. ½ q. 4. h.	3.20	100	V.	48	Slowing; c-r; cl. imp.
	Inf. oz. ½ q. 4. h.	2.40	64—80	V.	44—56	Slowing; cl. imp.
3	Tr. m. xx q. 4. h.	2.20+	180	V.	80	Slowing; cl. imp See Note 3 below
	Tr. m. x t. i. d.	1.50	105	V.	88	Slowing; c-r; cl. imp.
4	Tr m. x q. 4. h.	1.60	140	V.	84	Slowing; c-r; cl. imp. See Note 4 below
	Tr. m. xx q. 4 h.	0.60	84	V.	68	Slowing; c-r
5	Tr. m. xxv q. 4. h.	3.66	80+	N.	56	Slowing; c-r; cl. imp.
6	Tr. m. xv q. 4. h.	2.30	84	V.	60—	Slowing; cl. imp.
	Tr. m. xx q. 4. h.	2.12	48	V.	42	Slowing; c-r See Notes 4 and 5 below
7	Tr. m. xx q. 4. h.	2.00	78+	N.	40	Slowing; c-r; cl. imp.
8	Tr. m. xv q. 4. h.	2.60	160	V.	44	Slowing; cl. imp. See Note 6 below
9	Tr. m. xx q. 4. h	1.86	88+	V.	76	Slowing; cl. imp.
10	Tr. m. xxx q. 6. h.	3.80+	84—100	V.	27—38	Slowing; cl. imp. See Notes 5 and 7 below
11	Tr. m. xxx q. 4. h.	4.36	88— 94	V.	64—90	Slowing; c-r; cl. imp. vent. ext. sys.

1. The dose was reduced to dr. 2 after four days.
2. The single occurrence of a rate of 56 in the first series is probably attributable to the fact that the pulse was irregular and weak, and that not all beats were felt.
3. Three minims of fluidextract of digitalis preceded the administration of the tincture.
4. In Case 4 after the first vomiting the digitalis was continued in the same doses, but with the addition of tr. nux. vomica m. x to each dose. This, however, had no effect on the vomiting, so both drugs were then stopped. In Case 6 the second course of digitalis was given along with m. x of tr. nux. vom., which, however, did not prevent the return of the vomiting.
5. In Case 6 atropin sulphate 3/100 grain subcutaneously caused the disappearance of the coupled rhythm and accelerated the pulse from 42 to 70 per minute. In Case 10, 3/100 grain of atropin sulphate subcutaneously caused very little increase in the pulse-rate—a rise from 27 per minute to 46 per minute.
6. Infusion of digitalis (1½ oz.) was given prior to the use of the tincture.
7. As the patient was in a serious condition strophanthin 0.5 mg. was given before the use of digitalis was started.

* c-r.=coupled rhythm; cl. imp.=clinical improvement.

TABLE 2.—CASES OF CHRONIC CARDIAC VALVULAR DISEASE WITH REGULAR RHYTHM

Case	Digitalis	Am't Dig. at N. or V. Gm. of Leaf	Pulse at beginning of Digitalis	Nausea or Vomiting	Pulse at Time of N. or V.	Other Effects of Digitalis at Time of N. or V. with Reference to Action of Drug on Heart.
12	If. oz. ½ q. 4 h.	2.60	92—120	V.	88—96	Sinus arhythmia. Clin. imp.
	If. dr. 2 q. 4 h.	1.92	80—100	V.	88—90	No tracing; notes incomplete.
13	T.m. x t. i. d.	2.00	68	N.	58	Recurrent h-b. Clin. imp. See Note 1 below.
	T.m. xx q. 4 h.	0.60	64	V.	48	Recurrent h-b.
14	T.m. xv q. 4 h.	2.30	88	V.	75	Clinical improvement. See Note 2 below.
15	T.m. xv q. 4 h.	2.66	72—92	V.	60—72	Clinical improvement. See Note 2 below.

1. In both instances the administration of atropin removed the heart-block, but in neither did it cause more than a trifling acceleration of the pulse.
2. In Case 14 the course of tr. dig. was broken by 5 doses of ½ oz. each of infusion. In Case 15 the tincture was given for 8 doses, being then followed by the infusion in ½ oz. doses q. 4 h. for 8 doses.

drug on the heart. A few of the cases reported by Cushny, Marris and Silberberg are omitted, being taken instead from the more detailed account given by Silberberg in his paper. No reported case which showed either nausea or vomiting has been omitted if the details given were at all adequate to the requirements. The cases, therefore, are not selected, except in so far as sufficiency of reported detail is concerned. These cases are given in Tables 3, 4 and 5, together with an indication of their exact source for reference.[4]

From Table 3 and notes, it is obvious that in every instance the development of nausea or vomiting was associated with definite evidence of the absorption of the digitalis and its action on the heart. The average amount (first course) causing these phenomena was 3.66 gm. of leaf (minimum 1.5 gm., maximum 8.5 gm.). As in my personal observations, the interval before the onset of nausea or emesis was several days, always more than two.

In Table 4 five instances of nausea or vomiting are recorded in which there was no certain evidence of the action of the drug on the heart. Four others (Cases 40 to 43) which were not "cardiac" cases also failed to show definite evidence of digitalis action on the heart when nausea or vomiting developed. It is remarkable that of so many patients with the normal heart-rhythm such a large proportion should have shown definite signs of the cardiac action of digitalis, when given in therapeutic doses. In this series the average amount taken before nausea or vomiting was caused was 3.34 gm. of leaf, and the interval was never less than two days.

TABLE 3.—CASES OF AURICULAR FIBRILLATION—FROM LITERATURE

Case	Tincture Digitalis	Am't. Dig. at N. or V. Gm. of Leaf	Nausea or Vomiting	Effects of Digitalis at Time of N. or V., with Reference to Action on Heart
M. 1	m. xv q. 4 h.	2.5	N.	Slowing
	m. xv q. 4 h.	4.0	N.	Slowing
	m. xv q. 4 h.	5.0	V.	Slowing
M. 2	m. xxx t. i. d.	3.5	V.	Slowing
M. 3	m. xxx t. i. d.	1.5	V.	Slowing
	dr. i. daily	2.25	V.	Slowing; coupled rhythm
M. 5	m. xv q. 4 h.	1.5	V.	Slowing *
	m. x t. i. d.	1.25	V.	Slowing; coupled rhythm
M. 6	m. xx q. 4 h.	2.6	N.	Slowing
M. 7	m. xv q. 4 h.	3.25	V.	Slowing; clinical improvement
M. 8	m. xv q. 4 h.	3.25	V.	Slowing
M. 9	m. xv t. i. d.	1.87	N.	Slowing †
	m. xv q. 4 h.	2.00	V.	Slowing
M. 10	m. xv q. 4 h.	1.50	V.	Slowing; clinical improvement
M. 13	m. xv q. 4 h.	6.00	N.	Slowing; clinical improvement
M. 14	m. xx t. i. d.	2.50	V.	Slowing; clinical improvement
M. 15	m. xx t. i. d.	3.50	N.	Slowing ;‡ clinical improvement
M. 16	m. x q. 4 h.	2.50	V.	Slowing; clinical improvement
A. 3	m. xv q. 4 h.	3.00	V.	Slowing; clinical improvement
C. M. S. 12	m. xx t. i. d.	8.50	V.	Slowing; coupled rhythm
C. M. S. 13	m. xx t. i. d.	3.00	N.	Slowing §
C. M. S. 14	m. xx t. i. d.	6.00	N.	Slowing ¶
C. M. S. 15	m. xx t. i. d.	8.37	V.	Slowing; coupled rhythm
S. 1		2.50	N.	Slowing
S. 3		3.50	N.	Slowing
S. 5		1.75	V.	Slowing
S. 6	m. xx t. i. d.	4.25	N.	Slowing
S. 7		7.59	V.	Slowing

* The first vomiting came on before noticeable slowing of the heart, but a note on the next day records clinical improvement, and slowing soon appeared. In the second course the slowing was synchronous with the vomiting. A third course gave results exactly similar to the second—slowing and coupled rhythm together with vomiting.
† Two additional courses of digitalis caused nausea in one and vomiting in the other, together with slowing.
‡ The slowing was not marked and lasted for one day only, but the clinical improvement was very definite.
§ Continuation of the digitalis caused a recurrence of nausea and the pulse slowed still further.
¶ Tincture of strophanthus was subsequently given to this patient (dose and interval not stated) and caused vomiting together with marked slowing of the pulse-rate.

DISCUSSION

Pharmacologic studies[1] show that in therapeutic doses the digitalis bodies produce nausea and vomiting by their direct action on the vomiting center in the medulla, and probably in no other way, for:

1. All true digitalis bodies are more actively emetic when administered intravenously than when given by mouth.

2. When emesis follows the oral administration of these bodies to cats it can be shown that emetic doses have been absorbed, and, on the other hand, when emesis does not result from the oral administration of many times the fatal vein dose, it can be shown that absorption has not taken place.

3. The phenomena characteristic of emesis follow the intravenous administration of the digitalis bodies to dogs after the removal of the gastro-intestinal tract.

As a result of these observations, and in the absence of any contrary evidence, we expressed the opinion that the emesis and nausea resulting from the clinical use of these drugs were due to their action on the vomiting center after absorption.

As evidence of the absorption of digitalis in man I chose its action on the heart. It was obvious that no two patients would respond with precisely similar indications of the cardiac action of the drug and, therefore, one or more of the following responses was believed to afford sufficient evidence of the action of the drug on the heart: (*a*) slowing of the pulse-rate definitely dependent on the use of the drug; (*b*) traceable alterations in the heart rhythm, such as heart-block (partial or complete), coupled rhythm, auricular fibrillation, ventricular extrasystoles, sinus arhythmia, or combinations of these; (*c*) clinical improvement, as indicated by diminution in, or disappearance of, cyanosis, dyspnea, orthopnea, venous congestion; decrease in the size of area of cardiac dulness; diuresis. It has been my practice throughout the analysis of the cases not to accept less than two of the phenomena in the third group as sufficient evidence of the action of the drug on the heart, and, therefore, of absorption of an effective quantity.

A further point in evidence of absorption, but one less constantly encountered through the circumstances of the case, is the presence of "cumulation" as shown by the need of a smaller amount of the drug in a second

4. In the tables the initials refer to the names of the authors as follows: M.—Mackenzie: Heart, 1910-1911, ii, 273. W.—Windle: Heart, 1911-1912, iii, 1. A.—Agassiz: Heart, 1911-1912, iii, 353. L.—Lewis: Heart, 1912-1913, iv, 171. C., M., S.—Cushny, Marris and Silberberg: Heart, 1912-1913, iv, 33. S.—Silberberg: Tr. Roy. Soc. Med., 1911, Pharm. and Therap. Sect., p. 192.

course of treatment to bring about an action on the heart.

In Tables 1 to 5, and the accompanying notes, I have collected and recorded 110 courses of treatment with one or other of the digitalis bodies resulting in nausea or vomiting.

All of the observations were most carefully made and I have subjected the cases taken from the literature to the same rigorous conditions of analysis as held for my own. The observations were made by no less than seven different men other than myself. They are summarized in Table 6.

Of 106 courses of digitalis treatment in cardiac disease resulting in the appearance of nausea or vomiting, 100, or 94.3 per cent., showed indisputable evidence of absorption of the drug prior to the onset of these symptoms. In fifty-five observations on cases with auricular fibrillation, nausea or vomiting was associated with the absorption of the drug in every instance. In fifty-one observations on cardiac cases with the normal rhythm, indisputable evidence of the absorption of the drug was available in forty-five instances, or 89.6 per cent. In four non-cardiac cases there was no evidence of the action of digitalis on the heart, but it must be mentioned that each of these patients took an amount of the drug equivalent, at least, to the minimum taken by the others who did show evidence of action on the heart, before nausea or vomiting was induced. This is also true of the six instances in cardiac cases in which there was either no evidence, or in which this was insufficient, for the positive statement that absorption had occurred. It is therefore quite evident that one would be justified in concluding that even in these instances absorption had taken place before the nausea or vomiting developed. If this is granted, there is, then, but a single instance in the entire series of 110 observations in which there is any doubt that the nausea and vomiting resulted only after the absorption of a sufficient amount of the drug. This one possible exception is referred to in the second footnote under Table 4, and in view of the facts just brought forth it seems unlikely that this was due to local action of the digitalis on the alimentary mucosa.

These observations not only yield overwhelming evidence to show that nausea and emesis resulting from the clinical use of the digitalis bodies are dependent on the absorption of a sufficient amount of the drug, and, therefore, as in animals, on its central action, but they afford equally unequivocal evidence against the belief in the local irritant action of these bodies. The drug was given by mouth in amounts varying from 0.25 mg. (1/250 grain) of crystalline digitoxin (Nativelle's digitalin granules) up to 0.21 gm. (3⅓ grains) of digitalis in the form of infusion, and 0.24 gm. (3¾ grains) in the form of tincture (British Pharmacopeia) at a single dose without causing any nausea or gastric symptoms whatever in the entire series, with but a single exception, prior to absorption of a sufficient amount to cause cardiac effects, although the dose was repeated at intervals ranging from once in six to once in four hours. I have in addition given several single doses of a dram of the tincture (6 grains or 0.36 gm. of leaf) of digitalis to different patients and have never seen nausea or vomiting result

TABLE 4.—NON-FIBRILLATING CASES—FROM LITERATURE

Case	Heart Lesion	Tincture Digitalis	Am't. Dig. at N. or V. Gm. of Leaf	Nausea or Vomiting	Effects of Digitalis at Time of N. or V. with Reference to Action on Heart
M. 17	Mit. sten.	m. xx t. i. d.	2.50	V.	"Felt better" *
	Mit. sten.	m. xx t. i. d.	3.50	V.	Auric. fib., slowing
M. 18	Mit. sten.	m. xx t. i. d.	3.00	V.	Slowing, heart-block
M. 19	Mit. sten.	m. xv t. i. d.	2.50	V.	Slowing †
M. 20	Mit. sten.	m. xv q. 4 h.	2.50	V.	Slowing, extra-syst. ‡
M. 21	Mit. sten.	m. xv q. 4 h.	2.75	V.	Heart-block §
M. 23	Mit. sten.	m. xv t. i. d.	2.25	V.	None on heart, etc. ¶
M. 24	Mit. sten.	m. xv q. 4 h.	5.87	V.	Slowing, heart-block, etc.
M. 25	Mit. sten.	m. xv t. i. d.	2.75	V.	Slowing, sinus arhyth. ‡
M. 27	Mit. & aor. dis.	m. xx t. i. d.	6.50+	V.	Slowing, heart-block
			4.50	V.	Slowing, heart-block, etc.
M. 28	Aort. dis.	m. xx t. i. d.	3.50	V.	Clinical improv.
M. 29	A. & M. dis.	m. xv q. 4 h.	2.50	V.	"Felt better"
		m. xv t. i. d.	2.25	V.	"Felt better" **
M. 30	Aort. dis.		2.37	V.	None evident
M. 31	A. & M. dis.	m. xv q. 4. h.	4.12	N.	Clinical improv. slowing? ††
M. 32	A. & M. dis.		2.00	V.	None evident
M. 33	A. & M. dis.	m. xv q. 4. h.	2.25	V.	Clinical improv.
M. 34	A. & M. dis.	m. xv q. 4. h.	2.12	V.	Clinical improv.
M. 35	A. & M. dis.	m. xv t. i. d.	3.50	V.	None evident
M. 36	A. & M. dis.	m. x t. i. d.	3.00	N.	Vent. ext.-syst.
M. 37	Paroxys. tach.	m. xx t. i. d.	2.00	N.	Slowing, aur. fibril.
M. 38	Tachycardia	m. xx t. i. d.	4.00	N.	Aur. fibril. ‡‡
M. 40	Emphysema	m. xv q. 4. h.	3.00	V.	None evident
M. 41	Tuberculosis	dr. i. q. d.	1.50	V.	None evident
M. 42	Tuberculosis	dr. i. q. d.	2.50	N.	None evident
M. 43	Tuberculosis	m. xx t. i. d.	2.00	N.	None evident
W.	Mit. dis.	m. xv t. i. d.	5.25	V.	Heart-block
C. M. S. 2	sl. sinus irreg.			N.	Incr. sinus irreg., slowing
S. 3	sl. sinus irreg.	m. xx t. i. d.	3.00	V.	Bigem. pulse, aur. ext.—synst.
S. 4	A. & M. insuf.	m. xx t. i. d.	5.00	N.	Heart-block.?
			6.50	N.	Heart-block.
S. 8	A. & M. dis.		7.50	V.	Heart-block.
S. 9	A. & M. dis.		5.00	N.	Heart-block.
S. 10	Mit. sten.		?	V.	Slowing
L. 2	Auric. flutter	m. xxx — c. q. d.	4.00	V.	Heart-block, aur. fibril.
L. 4	Auric. flutter	m. xxx — lx q. d.	2.50	V.	Heart-block

* The notes state that the patient felt better, but that there was not much improvement, and the table shows no slowing of the pulse. The second course of digitalis was followed by vomiting associated with indisputable evidence of digitalis action on the heart.

† This patient vomited on the second day, after 0.75 gm. of digitalis, but there is no note to guide me in forming a correct opinion of the cause of this vomiting; it is possible that it was due to the digitalis, but it is just as likely to have been the result of some other cause, such as the venous congestion so often present in cases of deficient heart action. In two other courses of digitalis (in addition to the one in the table) there was vomiting, and in one of these slowing was marked.

‡ The detailed record shows the pulse to have slowed from 72 to 80 to 57 to 60, though the notes state that there was no appreciable effect on the heart-rate.

§ The heart-block appeared in tracings taken on the day after the vomiting and cessation of digitalis.

¶ The notes state that the respiration had become easier.

‡ These phenomena were repeated after another course of digitalis (3 gm.).

** The notes state that after the first course the patient felt better than on any day since she had been in the hospital.

†† On the date of vomiting, "A pulse rate of 54 and one of 100 was noted . . . ."

‡‡ A second course (1 gm.) caused nausea but no effect on the heart rate.

directly from such large doses.[5] These observations controvert the statements that the digitalis bodies are irritant to the gastro-intestinal mucosa in therapeutic amounts. This agrees precisely with the experimental observations made by Dr. Hatcher and myself on this point. We also found that even the commonly incriminated fixed oil of digitalis, and digitonin, did not irritate the stomach or cause vomiting, except when the latter was given in enormous quantities, such as would be utterly impossible in the use of even the most impure galenical.

CONCLUSIONS

1. There is neither valid experimental nor clinical evidence that therapeutic doses of the digitalis bodies cause nausea or vomiting through local irritant action on the alimentary tract.

2. There is very strong evidence, both experimental and clinical, for the statement that the digitalis bodies do not cause vomiting or nausea by local irritation of the alimentary tract.

3. There is experimental evidence that the nausea and vomiting resulting from therapeutic quantities of these bodies are due solely to their direct action on the vomiting center and therefore result only after the absorption of a sufficient amount of the drug.

4. The clinical evidence brought forth in this paper is in agreement with all preceding experimental evidence to the effect that nausea and vomiting from therapeutic quantities of the digitalis bodies result from their absorption, and not from their local action.

5. The conclusion that the nausea and vomiting resulting from the therapeutic use of these bodies in man are due to their direct action on the vomiting center is a logical necessity.

I do not wish to imply that, in certain rare instances in patients whose reflex vomiting mechanisms are hypersusceptible, the administration of a dose or so of digitalis might not cause vomiting quite without the participation of any direct central action. We all know that a sip of milk or a drink of water is capable of provoking vomiting in some hypersensitive people. I do believe, however, that the emetic action of the digitalis bodies in man is central in practically all cases, and I believe that carefully conducted clinical observations will fully substantiate this statement.

DEDUCTION

From these conclusions I wish to make one deduction: Inasmuch as it has been shown that all true digitalis bodies produce nausea and vomiting by direct central action, it is fallacious and wholly irrational to seek to avoid these symptoms resulting from the oral administration of any given preparation by resort to another preparation or to another channel of administration. Such means have been resorted to frequently and often with a disappearance of the nausea or vomiting. When this has been the case the new preparation has been either weaker or less well absorbed, or the new channel has been one from which absorption has been less complete. Such observations do not in any way contradict the conclusions of this paper, but rather support them.

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TABLE 5.—PATIENTS RECEIVING DIGITALIS BODIES OTHER THAN THE LEAF

Case	Heart Lesion	Digitalis Body	Am't. at Time of N. or V.	Nausea or Vomiting	Effects of Drug at Time of N. or V., with Reference to Action on the Heart
			mg.		
L. 3	Auric. flutter	Nativ. Digitalin	9.0	N.	Slowing, heart-block
M. 11	Auric. fibril.	Nativ. Digitalin	2.25	N.	Slowing
M. 38	Tachycardia	Nativ. Digitalin	8.25	N.	Slowing
M. 39	Heart-block	Nativ. Digitalin	3.75	N.	Clinical improv. *
			gm.		
M. 7	Auric. fibril.	Tr. Str. m. xxx t. i. d.	0.6	V.	Slowing, clin. improv.
M. 9	Auric. fibril.	Tr. Str. dr. i. q. d.	0.2	V.	Slowing
M. 10	Auric. fibril.	Tr. Str. m. xv q. 4. h.	1.0	N.	Slowing
M. 13	Auric. fibril.	Tr. Str. m. xxx q. 4. h.	1.9	V.	Slowing
M. 19	Mit. sten., reg.	Tr. Str. m. xv q. 4. h.	0.7	N.	Slowing
M. 25	Mit. sten., reg.	Tr. Str. m. xv q. 4. h.	1.6	N.	Slowing
W.	Mit. disease reg.	Tr. Str. m. xv q. 4. h.	0.9	N.	Slowing, heart-block
			1.2	V.	Slowing, heart-block
C. M. S. 15	Aur. fibril.	Tr. Str. m. xx t. i. d.	0.3+	V.	Slowing, bigeminus
M. 9	Aur. fibril.	Tr. Scillae		R.	Slowing, clin. improv. †
W.	Mit. disease	Tr. Scillae m. xxx t. i. d.		N.	Heart-block
W.	Mit. disease	Ext. Apocynum		V.	Slowing

* In this case the heart-rate before the digitalis was given was only 30 per minute, and hence no slowing was to be expected as a result of treatment.

† The record states that there was marked retching (R) but no vomiting.

TABLE 6.—SUMMARY OF ALL OBSERVATIONS

Classification	Number of Instances Showing N. or V.	Number in Which There Was Positive Evidence of Action of Digitalis on Heart	Per cent. Showing Action on Heart
Auricular fibrillation	55	55	100
Cardiac disease with regular rhythm	51	45	89.6
Non-cardiac	4	0	0
Cardiac (total)	106	100	94.3
Total	110	100	90.9

5. Since the reading of this paper I have given as much as 2 drams of the tincture (12 grains of leaf) at a single dose without causing either nausea or vomiting.

ABSTRACT OF DISCUSSION

DR. CLYDE BROOKS, Pittsburgh, Pa.: Dr. Schleiter and I carried out some experiments on the effect of digitalis on the blood-pressure of the unanesthetized animal. We incidentally observed that tincture of digitalis administered intravenously did cause vomiting. We agree with Eggleston and Hatcher that the emesis is a result of the action of the drug on the central vomiting mechanism.

DR. ROBERT A. HATCHER, New York: The testimony of various clinical observers concerning strophanthus supports our own contentions regarding this drug. Fraser, in 1885, found that strophanthus caused fewer gastro-intestinal disturbances than digitalis, a fact which is explained, in part, by my own observations that strophanthus is not absorbed so readily as digitalis from the gastro-intestinal tract, but that strophanthus is actually less actively emetic than digitalis in proportion to the cardiac activity. Curiously, true digitalin, which has been supposed to be the least actively emetic, is in fact the most actively emetic of all of the digitalis bodies in proportion to its cardiac activity, the explanation of its seemingly slight emetic activity being that it has been used in extremely small doses.

PHYSIOLOGY OF THE PYLORUS, PILLEUS VENTRICULI AND DUODENUM AS OBSERVED ROENTGENOGRAPHICALLY *

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Until 1892 the commonly accepted theory of gastric evacuation had been that offered by Richet and Rossbach, that the stomach contents were first thoroughly mixed with the gastric juices and, after three or four hours, passed rapidly into the duodenum. This conception was discredited by the results of independent investigations on dogs by Hirsch (1892) and Mering (1893), who substituted for it the theory of a rhythmically opening and closing pylorus, through which evacuation began immediately after ingestion. In 1898 Canno announced the discovery of a progressive peristalsis in the cat, and eleven years later Kaestle, Rieder and Rosenthal demonstrated a corresponding phenomenon in the human being.

My conception of the gastric motor phenomenon has been previously described,[1] and will therefore be referred to only in brief. Like the heart-action, gastric action takes place in cycles, marked by a systole and diastole or an alternating contraction and relaxation of all of the peristaltic waves (Figs. 1 to 4). A cycle exists during the time occupied by the formation and duration of each terminal wave. Accordingly the number of cycles required for the progress of an individual peristaltic contraction from its origin near the fundus to its termination at the pyloric sphincter is determined by the number of waves simultaneously exhibited in the stomach. The motor phenomenon is therefore said to be of the one, two, three (Figs. 1 to 4), four, five or six cycle type.

The important rôle played by the small intestine in gastric evacuation was recognized by physiologists thirty years ago; but the peculiar function and diagnostic significance of that region known as the first portion of the duodenum has not been fully comprehended heretofore. It has none of the characteristics of the descending and horizontal duodenum. On the contrary it corresponds so entirely in contour with the pars pylorica and has so many characteristics of the stomach that roentgenographically one is compelled to consider it a continuation of the stomach itself (Figs. 5 to 8). These points were fully described by me[2] in an article in which the term "pyloric cap" was first applied to the first portion of the duodenum. The word cap is more popular than scientific, however, and therefore, with the aid of Dr. Tower of the New York Museum of Natural History, I selected the latin term "pilleus ventriculi," or cap of the stomach.

Considering the active interest now being evinced in duodenal ulcer, as indicated by the recent communications of Moynihan, Codman, the Mayo brothers, Schwartz and Strauss, it may be appropriate more fully to state my reasons for referring to this region as gastric rather than duodenal. Embryologically it has long been recognized that the upper portion of the duodenum is stomach rather than intestine. Mayo[3] calls attention to the fact that "in the early state of fetal existence the duodenum above the common duct is part of the pyloric end of the stomach. Coming from the primitive foregut, it is associated with the stomach in its physiology and pathology, and it is not part of the small intestine, which comes from the midgut."

Anatomically the first portion of the duodenum differs materially from the descending or horizontal portions. Dwight[4] observes that "the first or ascending portion of the duodenum has a strikingly different appearance from the second and third portions, which present numerous, small, irregular folds, particularly on the posterior aspect."

Schwarz[5] calls attention to the dilatation of the pars superior duodeni as observed roentgenographically, and from anatomic and histologic studies notes the resemblance between it and the stomach. 1. The pars horizontalis superior has a smooth inner wall, presenting the delicate, striped longitudinal folds of the stomach lining. The ring-like folds characteristic of the upper part of the jejunum are not present, but appear first in the upper portion of the descending duodenum. 2. Together with the stomach it is attached to the liver by the gastroduodenal hepatic ligament. 3. Histologically it resembles the pars pylorica in that the pepsin glands of Brunner are found here in abundance.

Physiologically the contents of the cap are acid, like the chyme in the stomach.

Surgically 95 per cent. of the ulcers which occur beyond the pylorus are found in the first 1½ inches of the intestine, namely, the cap. They should therefore be described as postpyloric rather than as duodenal ulcers.

The first roentgenograms presenting the cap were exhibited by Henry Hulst in 1906 to illustrate his presidential address before the American Roentgen Ray Society.[6] Its roentgen shadow, however, so closely resembles the pars pylorica that Hulst interpreted this postpyloric region as the pyloric antrum. The dimensions of the cap, like those of the stomach, depend partly on its distention during different stages of digestion, different phases of the cycle and different stages of duodenal peristalsis (compare Figs. 1 and 2 with Figs. 3 and 4). The posture of the body also influences its size, shape and position. The roentgenographic appearance of the cap is of inestimable value in the recognition of gastroduodenal lesions. Variations resembling pathologic deformities are often seen in some of the plates of each series, but these can be readily recognized and definitely differentiated from organic changes. The small indentation frequently observed on either the right or left side of the cap may be due to pressure from the descending portion of the duodenum, the common bile-duct, or the vena porta (Fig. 6). Spasmodic contraction of the cap (Fig. 9) is often the result of iliac stasis, a Lane's kink, or a diseased appendix. Incomplete filling of the cap may be caused by overactive duodenal peristalsis (Figs. 10 and 11). This is more likely to occur in the early stage of digestion, when the pyloric sphincter is strongly contracted, than in the later stages when the sphincter is relaxed and the gastric peristalsis more efficient, even though less active (compare Figs. 12 and 13, and Figs. 15 and 16).

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

*Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Cole, Lewis Gregory: Arch. Roentg. Ray, December, 1911, No. 137, p. 242; The Value of Serial Radiography in Gastro-Intestinal Diagnosis, THE JOURNAL A. M. A., Nov. 30, 1912, p. 1947.

2. Cole, Lewis Gregory: Arch. Roentgen Ray, April, 1912.

3. Mayo, W. J.: Ulcer of the Duodenum, with a Report of Two Hundred and Seventy-Two Operations, THE JOURNAL A. M. A., Aug. 15, 1908, p. 556.

4. Dwight: Jour. of Anat. and Physiol.

5. Schwarz: Berl. klin. Wchnschr., 1908, No. 24.

6. Hulst, Henry: Am. Quart. Roentgenol, January, 1907, p. 9. Case 4.

The function of the cap is that of a reservoir. It receives the acid chyme propelled through the pylorus during the systole of each cycle (Figs. 1, 2 and 8). During the early stage of digestion the chyme is rapidly withdrawn from the reservoir cap by a rather broad periodic peristaltic contraction (Figs. 7 and 10), which propels it through the duodenum, possibly caused by the alternating alkaline and acid reactions in this portion of the intestine. As digestion progresses the cap is more completely filled with the acid chyme, and, considering the presence of Brunner's glands, it is probable that the finishing touches of gastric digestion are received here by the small portion of chyme thus isolated from the bulk of food in the stomach.

The cap is separated from the pars pylorica by a space varying from 1/8 to 1/4 inch, indicating the pyloric sphincter (Fig. 8). The importance of its roentgenographic appearance is second only to that of the cap in the diagnosis of lesions in this region. Both its gastric and duodenal surfaces should be smooth and clear-cut, and the lumen should be centrally located. The amount of contraction of the pyloric sphincter is clearly defined roentgenographically. As a rule, it is in proportion to the activity of the gastric peristalsis, that is, when the gastric peristalsis is feeble the contraction of the sphincter is weak (Fig. 13), and when the gastric peristalsis is strong, the sphincter is more tightly contracted (Fig. 12). Alteration in the balance between the contraction of the sphincter and the tone of the stomach is one of the functional disturbances of the pylorus which can be recognized roentgenographically. It causes either a retention of food or an unusually rapid evacuation of the stomach with dilatation of the cap, and sometimes dilatation of the duodenum and jejunum (Fig. 14). In the earlier stages of digestion, when the gastric peristalsis is active, the muscle of the pyloric sphincter contracts

Figure 1.

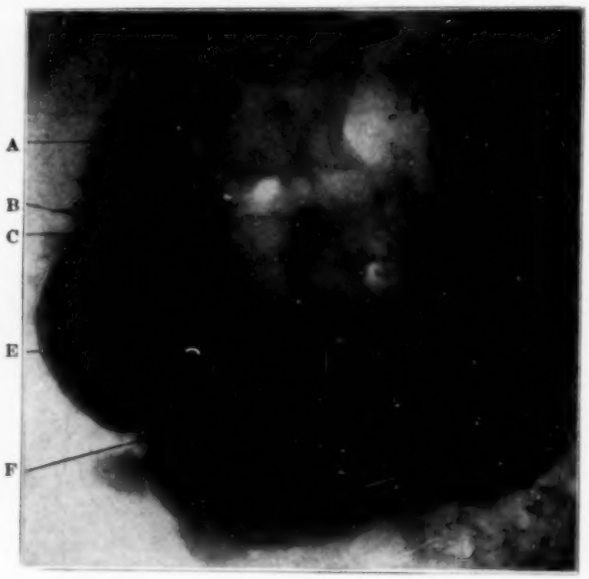


Figure 2.

TWO PHASES OF STAGE OF SYSTOLE

A, cap; *B*, lumen; *C*, pyloric sphincter; *D*, descending duodenum; *E*, terminal wave; *F*, peristaltic contraction.

Figure 3.

TWO PHASES OF STAGE OF DIASTOLE (same case as above). Note relaxation of peristaltic contractions.

Figure 4.

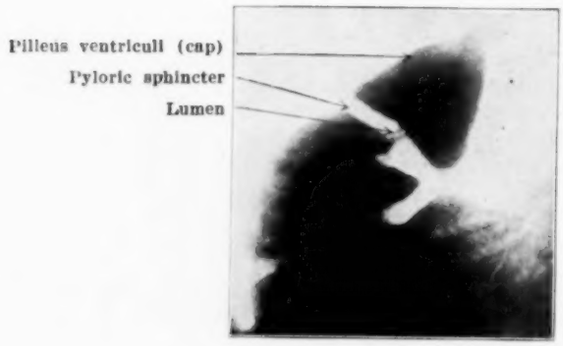


Fig. 5.—Pilleus ventriculi (cap).

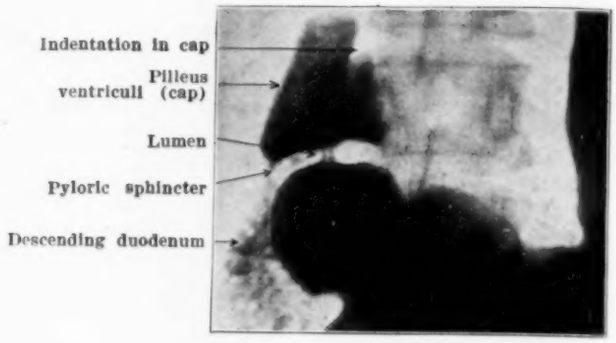


Fig. 6.—Pilleus ventriculi (cap).

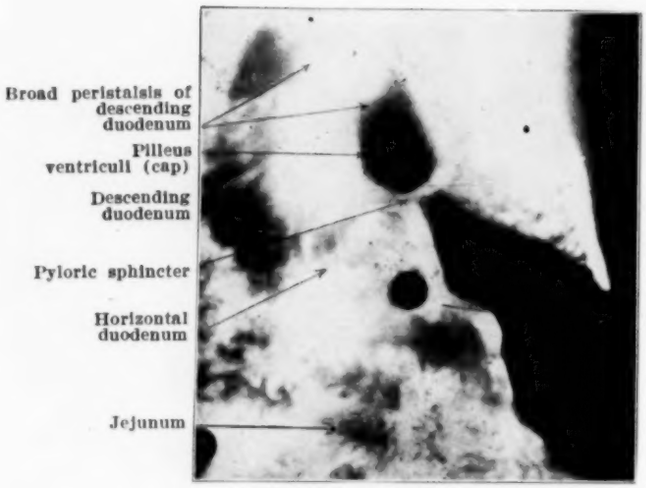


Fig. 7.—Evacuation of cap by broad peristaltic contraction of descending duodenum.

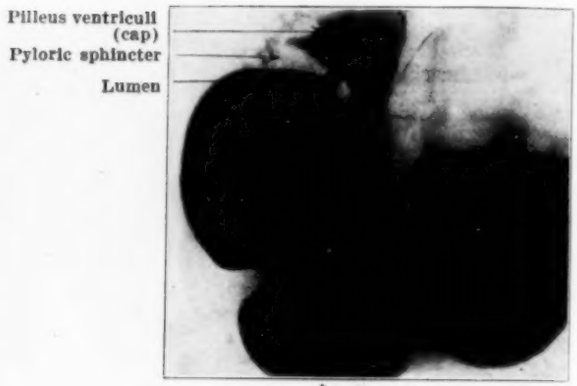


Fig. 8.—Chyme passing through lumen of pyloric sphincter into reservoir cap.

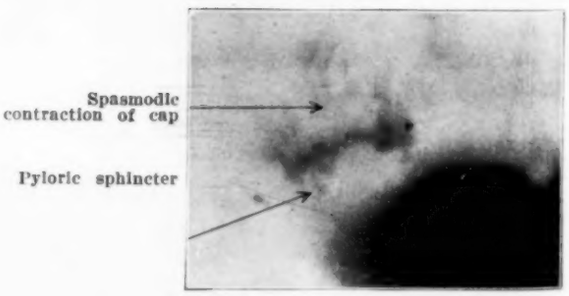


Fig. 9.—Spasm of cap caused by infected appendix.

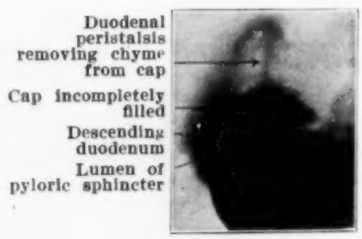


Fig. 10.—Active duodenal peristalsis.

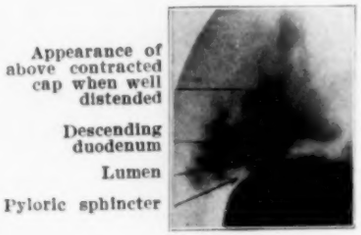


Fig. 11.—Cap well distended. Same case as Fig. 10.

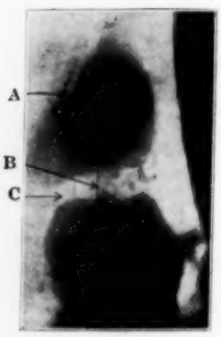


Fig. 12.—Pyloric sphincter tightly contracted immediately after ingestion; A, incomplete filling of pilleus ventriculi (cap); B, narrow lumen; C, pyloric sphincter tightly contracted.

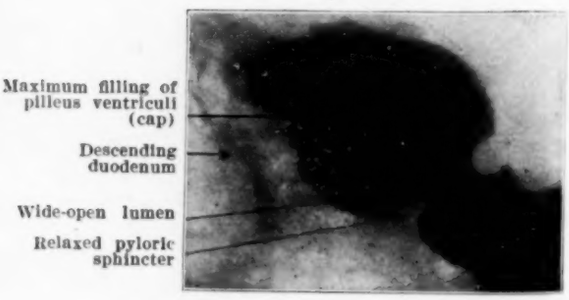


Fig. 13.—Pyloric sphincter relaxed, lumen wide open, six hours after ingestion. Same case as Fig. 12.

tightly (Fig. 12). As peristalsis grows feebler, the contraction of the sphincter becomes less toxic, until, during the later stages of digestion, it is greatly relaxed and its lumen comparatively large (Fig. 13).

The motor phenomenon of the pyloric sphincter forms the heart of this communication. Cannon[7] refers to the sphincter as the "keeper of the gate"; and before seeing his appropriate term, I referred to the sphincter in a previous communication[8] as a butler, guarding the entrance to the intestine, and allowing only such food

Fig. 14.—Dilatation of duodenum caused by rapid evacuation of stomach through relaxed sphincter.

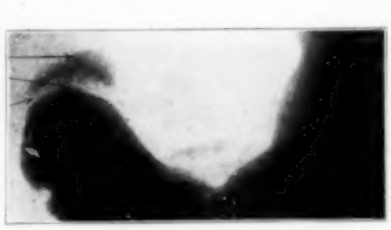


Fig. 15.—Cap incompletely filled in early stages of digestion.

Fig. 16.—Cap containing maximum amount during later stage of digestion. Same case as Fig. 14.

as is properly prepared to be served to the intestine. More recent observations, however, lead me to believe that the pylorus is not the only or the most important factor in replenishing the descending and horizontal duodenum.

Several important questions regarding the function of the sphincter and its relation to the evacuation of the stomach should be considered here. Some of them have apparently been settled so conclusively by careful physiologic observations that it is with the greatest amount of timidity that I approach the subject; but the roentgenographic evidence is so significant that it cannot be ignored. Does the pylorus relax and contract periodically for the expulsion of chyme, independently of each peristaltic contraction, or is the chyme forced through the pyloric sphincter by each systole? The question of whether or not the pylorus relaxes and contracts periodically, independently of each peristaltic contraction, has been considered so definitely proved in the affirmative by careful physiologic observation that the energies of investigators have been directed solely toward determining the factors which control its contraction and relaxation. Let us first consider what physiologists regard as the periodic contraction and relaxation of the sphincter.

In accordance with Mering's theory of a rhythmically opening and closing sphincter, Cannon describes the motor phenomena of the pylorus as follows: "Wave after wave passes with almost no perceptible variation of depth. Yet as the waves are passing with such notable uniformity the pylorus may open before the pressure of an approaching constriction, and the mass in the antrum then released will be driven forth into the duodenum. The next wave and perhaps many thereafter of approximately the same depth may fail to press the food onward." Schicker doubts a rhythmically opening and closing pylorus and believes that the pylorus is open only during the relatively short duration of the antrum contraction.

From a careful study of more than twelve thousand serial roentgenograms of about five hundred cases, I am unable to detect any such relaxation and contraction as has been described, but it may be contended that this is only a sudden squirt and that therefore none of the twelve thousand roentgenograms showed the sphincter during relaxation. This criticism would be hard to disprove unless we demonstrated some other method of evacuation. A study of all these roentgenograms shows that during the systole of every gastric cycle the pylorus is open, and through its lumen, which varies from 1/8 to 3/16 inch in diameter, a small amount of the liquid chyme is propelled into the reservoir cap (Figs. 1 and 2). This period of expulsion consumes approximately seven tenths of the cycle. The other three tenths of the cycle is occupied by the diastole. The terminal peristaltic contraction, which has meanwhile been advancing toward the pylorus, now attains the sphincter and effects its closure, so that the lumen is entirely obliterated, or visible only as a hair-line (Figs. 3 and 4). Thus the chyme in the cap is mechanically prevented from dropping back into the stomach when the patient is in the erect posture.

A further question to be considered is what factors other than the sphincter and gastric motor phenomena have a direct influence on gastric evacuation. According to Marbaix[9] "the duodenum exerts the influence for the replete intestine on the closing of the pylorus." Mering[10] concludes from his investigations that "the filling of the small intestine reflexly retards the emptying of the stomach." Schicker[11] is also of the same opinion. The roentgenographic findings indicate that this reflex from the replete intestine is practiced, not on the pyloric sphincter, but on the contraction which withdraws the chyme from the reservoir cap, as the duodenum is replenished from the cap and not from the stomach. During the later stage of digestion the cap retains its maximum content. (Figs. 13 and 16.) Apparently,

7. Cannon: Am. Jour. Physiol., 1907, xx, 289.
8. Cole, L. G.: Arch. Roentg. Ray, April, 1912, p. 427.
9. Marbaix: La cellule, 1898, xiv, 251.
10. Mering: Verhandl. d. Cong. f. inn. Med., Wiesbaden, 1893, xii, 471.
11. Schicker: Deutsch. Arch. f. klin. Med., 1911, No. 104, p. 366.

therefore, duodenal receptivity controls the evacuation of the cap through duodenal peristalsis rather than the evacuation of the stomach through a pyloric reflex.

Whether the rapid withdrawal of chyme from the cap during the early stage of digestion (Figs. 12 and 15) results from its slight acidity or its fluidity or is demanded by the hungry intestine below is beyond my sphere to determine. Here is a fertile field for physiologic research. Personally I believe that the hungry intestine is an important factor, because when the food reaches the ileum, the activity of the duodenal peristalsis is much diminished and consequently the cap retains more and the jejunum receives less than during the early stage of digestion.

The motor phenomena of the pylorus, pilleus ventriculi and duodenum herein described as observed roentgenographically, may be demonstrated in all human stomachs having a moderately active peristalsis. Whether or not the same is true of the lower animals I do not know. It may be that especial activities have been evolved by the erect posture of man, differing from the gastric motor phenomena in the lower animals.

103 Park Avenue.

ABSTRACT OF DISCUSSION

DR. W. B. CANNON, Boston: The phenomena of systole and diastole of the stomach along with peristalsis I have observed in the dog, but I do not recall ever having observed them in the cat. In the cat the waves run along smoothly from their origin. The phenomenon of the cap I have never seen in the lower animals. As the food emerges from the stomach it is shot along the duodenum for some distance, but does not accumulate, in my experience, immediately beyond the pylorus. The phenomenon of the "cap" raises the question as to the control of the discharge from the stomach in man. In the lower animals, I believe that the evidence is pretty clear that the discharge is controlled by the acid reaction of the contents, and I should rather expect that that would be the explanation of the discharge in human beings. It would be interesting indeed to know what the effect of different foodstuffs would be on the rate of the discharge. The idea that the pylorus opens "periodically" in lower animals, is one that ought not, I think, to be allowed to prevail; at least, I am quite sure that that is not the way in which the pylorus opens in the cat and dog, if by "periodic" is meant at perfectly rhythmic intervals. As I tried to explain in a paper which I wrote in 1898, a wave coming along will discharge food through the pylorus, and then there may be no discharge for the next three waves, we will say, and the fourth wave will again discharge food through the pylorus and perhaps the next seven or eight waves may not discharge food. In other words, there is not a discharge in these animals with every wave or every fifth wave, or with anything like the rhythmicality which is observed in the peristalsis of the stomach itself.

DR. A. J. CARLSON, Chicago: The motion pictures were so confusing that I would hesitate to base any conclusion on them alone. I presume that the results with roentgenoscopy have been controlled by the fluoroscopic observations. There is no question but that Dr. Cannon's description of the action of the pylorus in cats and dogs is correct. My observation has been made on fifty or sixty animals and in every case the opening of the pylorus occurs as Dr. Cannon has described. Owing to the position of this upper end of the duodenum in man when in the upright position there may be a retention there and a tendency to dilatation; but I doubt Dr. Cole's "systole and diastole theory." It makes necessary an entirely different control of the pylorus in man than in the dog and the cat. I should like to ask for the authority for the statement that this portion of the duodenum secretes hydrochloric acid.

DR. J. T. CASE, Battle Creek, Mich.: From my experience with several thousand bismuth-meal examinations, I find I am not altogether in accord with the views expressed. Dr. Cole has made his studies roentgenographically, involving the production of numerous roentgenograms. The moving-picture films have been pieced together, so to speak, and they are not true cinematograph reproductions, and some of the happenings apparently shown by the films are, I believe, artifacts.

My observations have been made with the fluoroscope and are based on roentgenographic studies of the stomach in several thousand cases. In my opinion, a sort of systole and diastole does occur, but not in the normal stomach. I have seen the phenomenon described by Dr. Cole, but my impression has always been that the cases in which it occurred have been those of pyloric obstruction and that periodically the stomach becomes fatigued. During the periods of fatigue, peristaltic waves are not so deep as they are at other times. When the stomach becomes rested, as it were, the waves become deeper. If it were possible to make a cinematographic film extending over a sufficient period of time, taking every wave of the stomach, I believe we should find, in certain pathologic stomachs, this phenomenon described by him as systole and diastole, and yet we should see that between the two phases there would be a considerable period of time. On the other hand, Cannon's observations as regards the control of the pylorus in animals have been absolutely confirmed in my observations on man. In fluoroscopic observations, I have repeatedly seen the behavior of the pylorus as described by Cannon, the opening of the pylorus occurring irregularly. After three or four waves have reached the pylorus, one may see the pylorus open and food pass through into the duodenum. Then again ten or twelve waves may reach the pylorus before it opens again. I have not been able to observe any rhythm or regularity as to the opening of the pylorus in man.

DR. W. B. CANNON, Boston: May I ask Dr. Case to describe his experience with the fluoroscope as applied to the cap? Is the appearance of the cap uniform?

DR. J. T. CASE, Battle Creek, Mich.: It has been hard for me to make up my mind with reference to that because so many of my cases have been pathologic and I have consequently hesitated to draw conclusions. From my observations on normal people, limited to forty or fifty persons, I must say that I have seen peristaltic waves empty the duodenal bulb completely at times. In working with the fluoroscope in favorable cases, one may see very well the succession of waves reaching the pylorus, with occasionally an opening of the pylorus and the passage of bismuth on into the duodenum. My experience with fluoroscopic observations of the stomach in man confirms the conclusions of Cannon based on animal experimentation. My conception of the function of the duodenal bulb is that it acts more or less as an equalizer, receiving the food from the pylorus and serving it into the duodenum in appropriate quantities. Holzknecht, years ago, called attention to the fact that the first part of the duodenum rarely undergoes peristaltic contraction.

DR. E. W. CALDWELL, New York: From fluoroscopic examinations which I have made I cannot agree with Dr. Cole that the shape of the so-called pyloric cap is peculiar to any individual. With the patient in different positions, and with different degrees and direction of pressure we can obtain almost any style of pyloric cap in the average person. Whenever we see the so-called pyloric cap triangular we may conclude that it is because the duodenum is deformed by pressure. I am, therefore, inclined to regard the triangular cap as an artifact.

DR. LEWIS GREGORY COLE, New York: My description of the evacuation of the cap corresponds so accurately with Dr. Cannon's description of the evacuation of the antrum, that Cannon, like Hulst, may have mistaken the cap for the antrum, and the occasional peristaltic contractions, which he describes as discharging the chyme through the pylorus, are what I mean by the broad, peristaltic contractions, which begin in the top of the cap and propel the chyme through the duodenum. This broad, propulsive peristalsis of the duo

denum may be controlled by an alternating acid and alkaline reaction in the descending duodenum. The relative value of fluoroscopy and roentgenoscopy is not a question to discuss before this section; but when the cap is shown in every one of forty plates, how can you doubt its presence, even though it is seen only occasionally on the fluoroscopic screen. Astronomic observations are based, not on ocular, but on photographic records. Photograph a man walking, and the snapshot will picture his feet in an incredible position. Similarly, I do not understand how you can discredit the definite evidence of the cap afforded by the permanent records of serial radiography. The photographs are assembled in the order of the progression of the peristalsis, and double exposures, made about one-half second apart on the same plate, provide the key which locks them together. Dr. Case says that he has not observed the systole and diastole fluoroscopically. By making a series of roentgenograms and comparing the extremes of systole and diastole, he will find a motor phenomenon not accounted for by the progression of peristalsis, and not readily recognized fluoroscopically. Furthermore, it is a phenomenon different from the periods of repose that occasionally occur during gastric digestion. The systole and diastole occur once during each cycle, which corresponds in time with the formation and duration of an antrum. The antrum exists for about seven seconds, I believe. The length of the cycle varies in different people, and I should rather not state the average time. Photographs made about four seconds apart show the extremes of systole and diastole. The peristaltic wave persists about twenty seconds from its origin at the fundus to its termination at the pylorus, not twenty seconds for its progression along the last two inches of the stomach. The systole and diastole correspond in time with the wave. I have my own opinion of the average length of time, but do not care to name it. I do say, however, that it corresponds with the formation and duration of each antrum or cycle.

UNIQUE WRIST INJURY

RECURRENT ANTERIOR DISLOCATION OF ULNA *

A. C. YODER, A.B., M.D.
GOSHEN, IND.

History.—Mrs. R., aged 36, Feb. 28, 1910, fell down-stairs and in some way hurt her left wrist. She immediately came to my office three blocks distant. Walking into the consultation room she held out her forearm in medium pronation, the hand and fingers slightly flexed. The patient thinks now that the hand was somewhat drawn to the ulnar side. I noticed an abnormal protuberance on the dorsum of wrist and made a hasty (before examination) diagnosis of Colles' fracture.

Examination and Treatment.—I examined the wrist and soon discovered that there was not a Colles' fracture; nor could I make out any fracture, except possibly one of the ulnar styloid. It was discovered that the ulna was dislocated forward and that it was easily reduced, but that when the pressure which was needed to reduce it was released, dislocation recurred. Motion in all directions was somewhat limited on account of pain. The deformity on the back of the wrist could not be reduced by manipulation or by pressure. By means of adhesive strips and an anterior splint the dislocation of the ulna was maintained. Rest of the part was advised for several weeks. In the meantime the splint was readjusted several times, but finally abandoned. At no time did the ulna show any tendency to remain in its normal place except when it was held there by some retaining force. The patient was finally advised to wear a wristlet and to use her wrist and hand as much as she could. A roentgenogram made March 30, 1910, a month after injury, did not show any fracture. In June, 1911, more than a year later, the patient returned, complaining of pain and weakness in her wrist. Two roentgenograms, one dorsal and one palmar, were taken. These pictures showed no fractures or any marked or complete dislocation, except that of the ulna. The patient was again advised to wear a wristlet. Motion was practically normal. The patient did not wear the wristlet long, but soon used her hand as much as ever.

Present Condition.—At present the wrist has practically normal motion, except that the patient has some hyperextension and somewhat limited flexion. It is nearly as strong as her right wrist. The patient does all kinds of heavy housework, using the left wrist without a support. She has no pain in the wrist. The deformity on the back of the hand persists. The inferior end of the ulna projects anteriorly when the hand is in supination. It is freely movable and is easily replaced; in fact, it reduces itself when the hand is pronated. It can be felt slipping back into the sigmoid cavity of the radius as the hand passes from supination to pronation. I cannot make out the triangular fibrocartilage, but it evidently must be ruptured, judging from the abnormally free range of motion of the end of the ulna and the ease with which it slips back into place. We may safely infer, in addition, that the anterior radio-ulnar ligament is ruptured. The dislocation of the ulna is clearly shown in the roentgenogram of this wrist (made by Dr. Lemon) in lateral view. This picture shows the ulna protruding far to the palmar side of the wrist.

We must yet account for the deformity on the back of the wrist. Here we find ourselves on debatable ground. Through the kindness of Drs. Lemon and Haywood I have had several roentgenograms of this wrist for study

Fig. 1.—*A*, normal wrist (right); *B*, injured wrist (left). Shows crowding together of carpal bones, subluxation of radiocarpal joint and overriding of semilunar and os magnum.

and examination and have freely consulted their opinions as to their interpretation of the plates. My present conclusion is that there is a slight backward dislocation of the radiocarpal joint, and that the carpals, though none of them are dislocated, are crowded together, and some of them more or less rotated on their axes, or possibly even slightly dislocated. As to the first part of my conclusion, subluxation backward of the radiocarpal joint, the fact that the deformity is on the back of the hand speaks for backward rather than forward dislocation. Other evidences of backward displacement are the diminutive size of the hypothenar eminence and the fact that the whole wrist and hand lie on a higher or more dorsal plane than normal, carrying with them the ridge and tubercle of the scaphoid and trapezium, so that they lie deeper in the wrist than normal. However, there is not complete luxation backward, first, because motion never was limited enough for that; secondly, because deformity was not great enough, and thirdly, because the roentgenograms do not show complete luxation.

* Read at the Elkhart County Medical Association at Goshen, Ind., March 6, 1913.

The fact that the plates show each carpal bone in contact with every other carpal bone just as it should be, together with the presence of free motion in the joint, justifies the second part of my conclusion; namely, that there is not a complete dislocation of any of the carpal bones. It has been held by others who have examined this case and the roentgenograms that the semilunar is dislocated. That it is not a complete dislocation is evident when one studies plates of other cases in which the dislocation was complete. Dislocation of the semilunar is rare. Stimson, in the third edition of his work, reports only thirteen cases. These dislocations are nearly always forward, and give rise to marked disability, and usually the bone has to be excised to restore function.

Fig. 2.—Lateral view of injured wrist showing anterior displacement of lower end of ulna, dorsal or backward subluxation of radiocarpal joint and absence of ulnar styloid.

The os magnum is a bone that may be completely dislocated without loss of function, and its dislocation is a backward dislocation. This deformity on the back of the wrist might be attributed to a backward dislocation of the os magnum, but the roentgenogram of the wrist in lateral view excludes this diagnosis. One is still further justified in excluding this diagnosis after comparing the roentgenogram of this case with that of Stimson's case in his text.[1] I do believe that the semilunar and os magnum have changed their relative positions a little, enough to give the picture of overlapping in the plate, but not enough to warrant saying that there is a dislocation; at best, we can say that there is a slight subluxation; that is, a partial dislocation of these two bones. I have not as yet fully made up my mind whether or not the small amount of overriding occurs from the fact that the semilunar overrides the os magnum, or the os magnum the semilunar.

To sum up the diagnosis of this case we have:

1. Fracture and disappearance of ulnar styloid.
2. Recurrent forward dislocation of ulna, with probable rupture of triangular fibrocartilage.
3. Subluxation, dorsally, of the radiocarpal joint.
4. Crowding together of many of the carpals.
5. Possibly a slight subluxation of semilunar and os magnum.

The prognosis of this case is good as to function, but absolutely bad with respect to restoration of parts.

The reason for reporting this case so extensively, aside from the interest in diagnosis, is the uniqueness of the lesion. Stimson does not mention recurrent luxation of the ulna. Cotton[2] reports two cases. He says:

A number of years ago there came into my care a young girl who had, as a result of trauma, a slipping of the ulna on the radius with every movement of supination. She was suffering severely from ulnar neuritis, as a result of constant irritation. Operative treatment was declined; mechanical treatment failed on account of the intolerance of the damaged nerve to pressure. In this case there had been a Colles' fracture. Recently I examined, with Dr. G. H. Monks, a case similar in all respects except for the neuritis.

This latter case was practically cured by him by an osteotomy that in effect tightened the radio-ulnar ligaments.

I do not know that the lesion has been described in the literature. Evidently there is an abnormal laxity of some or all of the radio-ulnar ligaments. I have seen many cases in which there was a little looseness here after Colles' fracture, but ordinarily it is of no consequence as a cause of weakness, and gives no pain.

This lesion, recurrent or habitual dislocation of the inferior end of the ulna, has been described, though meagerly, in the literature. Hoffa[3] reported three cases of his own and speaks of finding but one other in the literature. Courtin[4] reported three cases of his own and mentions another case spoken of by Hamilton. We have then a record of eight cases of recurrent radio-ulnar dislocation, to which may be added the two cases spoken of by Cotton, to which I wish to add my case as the eleventh case reported.

Again, dislocations of the radiocarpal joint are rare, notwithstanding the fact that once they were considered common. Stimson reports a total of about seventy cases. In this connection he, with his extensive practice and opportunity of seeing cases, speaks of seeing one case. My case will add another to the list.[5]

I wish to extend most hearty thanks to Drs. Lemon and Haywood for their kindly interest in the case and their work in furnishing the roentgenograms.

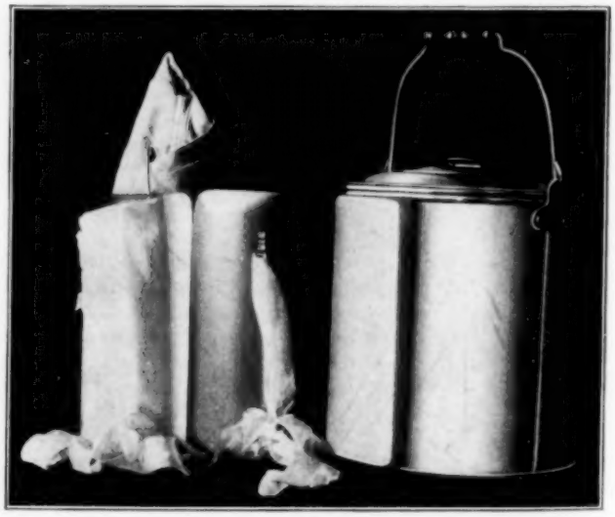
1. Stimson: Fractures and Dislocations, ed. 3, Plate xxix, opposite p. 688.
2. Cotton: Dislocations and Joint Fractures, p. 364.

A FIRST-AID PACKET FOR MINER'S USE

W. V. GAGE, M.D., PRIMERO, COLO.

The accompanying illustration shows a new idea in first-aid packet construction, and also the expedient which has been adopted to compel, as nearly as possible, the presence of the packet in case of underground injury.

The packet is made of tin, is 8 inches long by 3 wide and is curved on itself laterally. It may contain such various first-



First-aid packet for miner's use, sealed and attached to dinner pail and open and ready for use.

3. Hoffa: Verhandl. d. deutsch. Gesellsch. f. Chir., 1898, Part 1, p. 156.
4. Courtin: Gaz. hebd. d. sc. méd. de Bordeaux, Oct. 8, 1905, p. 481.
5. I have noticed with interest the following reports: Miller, A. M.: Primary Traumatic Dorsal Complete Radiocarpal Dislocation, Surg., Gynec. and Obst., April, 1913. Skillern, P. G.: Cases Illustrative of (1) Fractures of Carpal Scaphoid with Luxation of Semilunar, (2) Fracture of Carpal Scaphoid with Palpable Deformity, THE JOURNAL A. M. A., May 17, 1913, p. 1536.

aid materials as would be demanded by the vocation of its carrier. It is one-half inch thick and its sides are soft soldered at their edges to a half-inch tin strip; thus the packet is sealed hermetically.

The narrow strip referred to is of such a length as to allow its ends to lap over each other for about an inch, leaving a tongue which is seized when the strip is to be torn off to open the packet and secure its contents. When the strip is removed, the various surgical dressings which the packet contains are at hand. As shown in the illustration, these consist of one triangular bandage, one yard of gauze, two safety pins and one bottle of aromatic spirits of ammonia.

In addition to the foregoing, it will be noted that the sides of the packet, when separated from each other, place at the hand of the first-aid worker two 8-inch splints, which may be utilized in steadying a fractured limb or in holding dressings in place.

At each end of one of the splints, and on the inside of the packet before it is opened, is a little tin strap, to which is attached a piece of tape or bandage, which serves to hold both splints in place, after being applied to an injured member.

After the packet had been devised, I was for some time at a loss for a plan which would guarantee that the packet be within reach of the injured miner in case of an underground accident, as it is obvious that, whatever the merit of a given first-aid packet, it must be immediately accessible in order that it may be of practical utility.

Miners, when "going inside," might for a few "shifts" take with them a pocket-carried packet, but the average man would soon neglect this on account of the bother, and the packet would usually be "outside" when needed for emergency work underground.

After numerous experiments, it was found most practical, in order to insure the presence of the packet underground, to soft-solder it to the miner's dinner bucket, the latter being the one article that always goes "inside" with its owner, and that is always within his reach or that of some one working close by.

In case of injury, a bucket is secured and the packet removed by a slight pull which breaks the three points of soldered contact to the pail. When the packet is in hand, it is opened either with the fingers, by pulling on the tongue end of the tin strip, or by inserting this tongue into the space between the blade and handle of a closed jack-knife, and rotating the knife until the strip is removed, and dressings, splints, etc., are available. Lastly, to make doubly sure that the packet would be within reach when wanted, that is, always on the pail, a quarter-inch hole was punched in the side of the bucket, near the bottom, and this hole was covered by, and soldered to, the packet.

In case the original packet is removed from the pail, another one must be soldered in its place to render the dinner bucket competent, as the liquid portion of the miner's meal is carried in the lower part of the pail, while the solid food is in a separate compartment above.

Although the 8-inch packet is the best size for miners' use, as it can be carried on the bucket, it is plain that, when not so carried, the packet can be made into any length or width for the various purposes for which it is intended.

According to the use it is to serve, the packet may contain dressings, etc., as demanded, and a second pair of splints slightly shorter and narrower than the outside ones may be included.

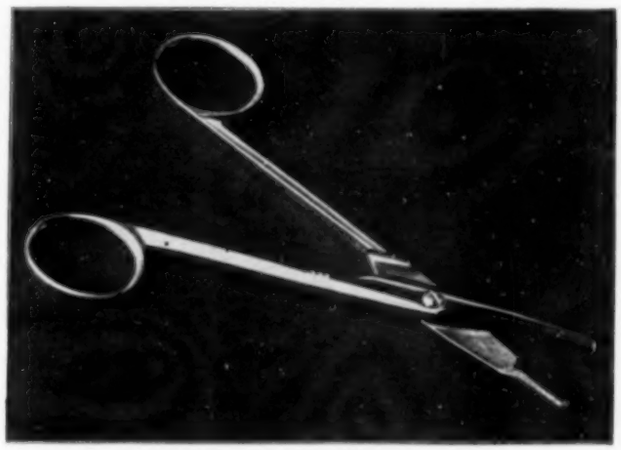
The curved formation of the packet renders it easily carried in the pocket, and a small metal clip attached to one end of its concave side near the end makes it ideal as a belt-carried device for the use of soldiers, sailors, the constabulary, etc.

A coating of lusterless brown stain would be essential for army or navy use, but for miners, railroaders, campers, and for household purposes, the unpainted packet would serve.

A NEW FORCEPS

CHARLES S. VENABLE, M.D., SAN ANTONIO, TEXAS

I have had made by Kny-Scherer a new instrument which may be of interest to readers of THE JOURNAL. It is a combined pair of scissors and mouse-toothed forceps. It is to be used by the first assistant in picking up structures to be sutured, drawing the needle through after it has pierced the



Combined scissors and mouse-toothed forceps.

structure and cutting the suture at the desired moment. It will be seen at a glance that this obviates the use of two and possibly three instruments to accomplish the same thing—namely, a thumb-forceps, a hemostat and a pair of scissors.

205 East Myrtle Street.

A USEFUL PIPET

JEROME E. COOK, M.D., ST. LOUIS

In the laboratory it is often desirable to have at hand some sort of suction pipet for removing sediments from the bottom of centrifuge-tubes, conical glasses, etc. Those pipets which are made by fitting a rubber bulb over the end of a piece of glass tubing are usually not very satisfactory and if lost or destroyed are not quickly replaced. A medicine-dropper is always at hand or easily obtained, and would make an ideal pipet if only the glass tube were long enough to reach the bottom of the ordinary centrifuge-tube. It can, however, be easily lengthened by drawing it out in the flame to any desired length, as seen in the illustration. This will make a most serviceable pipet which is cheap and which if broken can be readily replaced.

Suction pipet made from a medicine-dropper.

[COMMENT.—The ordinary medicine-dropper is rather short for making such a pipet. As long a one as possible should be selected. Another way to secure the same result is to draw out a piece of tubing to a point and slip over the end a short piece of rubber tubing, by which the bulb of the medicine-dropper can be accurately adjusted to the tube. In this way the pipet can be made of any desired length.—ED.]

LONGITUDINAL FRACTURE OF THE LOWER END OF THE RADIUS TOWARD THE ULNAR SURFACE

JAMES C. WILHOIT, M.D., MANHATTAN, KAN.

Longitudinal fractures of the lower end of the radius are exceedingly rare. Cotton[1] speaks of only three specimens. Parrish[2] and Bendell[3] probably have the only roentgenographic illustration of the lesion. So far as I can learn, this case is the only longitudinal fracture of the radius that split toward the ulnar surface.

Longitudinal fracture of lower end of radius.

J. H. G., farmer aged 38, May 3, 1913, was boxing hats; his antagonist caught him by the fingers of his right hand and in jerking to free himself he felt something in his wrist snap. He consulted me the day of the injury and on roentgenoscopy the fracture was located.

1. Cotton: Dislocation and Joint Fractures.
2. Parrish, R. C.: Longitudinal Fracture of the Lower Extremity of the Radius, THE JOURNAL A. M. A., Jan. 11, 1913, p. 123.
3. Bendell, J. W.: Longitudinal Fissured Fracture of the Lower End of the Radius, THE JOURNAL A. M. A., May 17, 1913, p. 1537.

Gentleness in Surgery.—The fact that some operators produce little constitutional disturbance, little shock, by the performance of an operation which at the hands of another causes very serious collapse, is not due to differences in the patient, in the anesthetist, in the method, or in anything else but the surgeon himself. There are surgeons who operate on the "canine" principle of savage attack, and the biting and tearing of tissues are terrible to witness. These are they who operate with one eye on the clock, and who judge the beauty of any procedure by the fewness of the minutes which it has taken to complete. There are other surgeons who believe in the "light hand," who use the utmost gentleness, and who deal lovingly with every tissue that they touch. The former type of operator is described by Crile as "carnivorous;" the latter type is nowhere better exhibited than in his own work. The scalpel is, indeed, an instrument of most precious use—in some hands a royal scepter; in others but a rude mattock. The perfect surgeon must have the "heart of a lion and the hand of a lady;" never the claws of a lion and the heart of a sheep.—Sir Berkeley Moynihan, Address in Surgery, Brit. Med. Assn., 1913.

A FATAL CASE OF COCCIDIOIDAL GRANULOMA

PHILIP KING BROWN, M.D., SAN FRANCISCO

History.—The patient was a Yaqui Indian, aged 30, speaking no English (history obtained through interpreter). He worked at McKittrick, San Joaquin Valley, California, with construction gang. He knew nothing of his family history. He said that he had never been sick before and denied venereal diseases.

Present Trouble.—July 25, 1911: Patient said that he had been sick for ten days. He felt warm and had pains all over him, in shoulders, hips and all joints. He had coughed for several months and had had some pains in the lungs. A couple of weeks after admittance, patient said that he had no pains anywhere, no chills and no sore throat, but that he had perspired freely day and night.

Physical Examination.—There was no evidence of a lesion anywhere. The heart-tones were clear and strong; there was no cough; there were no signs in the lungs of any trouble. The pain in the joints of which he complained was not bad, and there was no evidence of swelling or tenderness. Even the pain in the joints disappeared without medication and did not return. The urethra and prostate presented no sign of trouble. The tonsils were slightly large but not inflamed. Widal and Moro reactions were negative. Blood-culture, urine and stools were negative. The blood-count was 24,650 at time of entrance, but three weeks later was normal.

Treatment and Course.—The progress of the disease was without incident except for the fever and failure to determine the nature of the infection. At the end of two weeks, because of negative findings, a mixed vaccine was used on the patient, pneumococci and streptococci predominating. There was no effect from this after two weeks and vaccine treatment was discontinued. The pulse was slow and the temperature ranged 3 or 4 degrees daily and was very irregular, ranging from 95.6 to 104 F., and going below normal several times.

The patient grew gradually weaker, râles developed in the lungs and he died fifty days after entering the hospital.

Laboratory Reports.—July 26, 1911: Urine: dark yellow; specific gravity, 1.015; reaction acid; sugar negative; albumin negative. Microscopic examination showed amorphous urates and a few finely granulated casts. Diazo-reaction negative. Widal negative.

Aug. 3, 1911: Widal, negative; blood-culture, negative. Differential blood-count: polynuclears, 76.5 per cent.; eosinophils, 4.5 per cent.; large lymphocytes, 1 per cent.; small lymphocytes, 18 per cent.

Aug. 4, 1911: Moro reaction negative.

Aug. 11, 1911: Sputum: elastic tissue, none; bacilli of tuberculosis, negative; diplococci, some; streptococci, many. Several days later sputum examinations showed absence of tubercle bacilli but presence of many diplococci and streptococci.

Feces: No pus, mucus or ocult blood; no ova or parasites.

July 27, 1911: White blood-cells, 24,560.

Aug. 15, 1911: White blood-cells, 9,000.

Sept. 11, 1911: White blood-cells, 11,150; blood-culture, negative; bacteriologic examination of catheterized specimen of urine, negative; palpation of prostate, negative.

Necropsy.—By Dr. W. T. Cummins. Typical lesions of miliary tuberculosis in lungs with fewer lesions in the other organs. The primary focus was the lumbar lymph-nodes which were soft and caseous, fluid pus showing in certain of them. It was not until sections were made of these lymph-nodes and the lung that it was discovered that the lesions were due to the coccidioidal organisms. There were no ulcerations in the intestines.

Characteristics of the Preceding Case.—The initial lesions were in the lumbar lymph-nodes, whereas in about 70 per cent. of the cases the lesions were primarily in the lungs. There were no skin lesions, which are present in at least one-third of the cases. Blood-cultures were tried on three occasions and were negative; in no previous case, so far as I know,

had blood-cultures been tried. The duration of the case could not have exceeded two months from the onset of the symptoms. The only other case as acute, in which the initial lesions were also in the intestinal tract is Case 15, of a duration of two and a half months.[1]

350 Post Street.

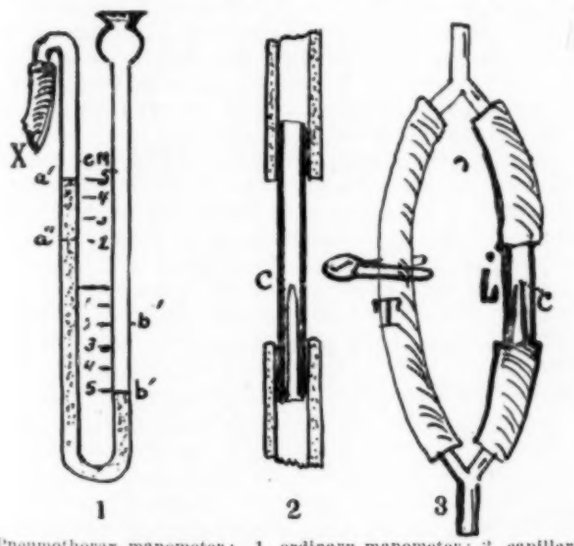
THE PNEUMOTHORAX MANOMETER

EDWARD VON ADELUNG, M.D., OAKLAND, CAL.

I have been surprised to note that while all physicians who employ artificial pneumothorax agree on the great importance of being closely guided by the manometer readings, they are reading their manometers in different ways. As in many other instances in which the records of one man must be compared with those of others, it is of crucial importance that a uniform method of recording be agreed on.

The commonly used manometer is constructed as depicted, Figure 1, being simply a U glass tube filled to zero with a fluid, water. Thoracic pressures are transmitted through a tube, *x*, and depress or "suck up" the fluid. If the pressure varies, as during breathing, of course the columns will oscillate.

For example, the left column (Fig. 1), under negative pressure, oscillates from a′ to a″, and simultaneously the right oscillates from b′ to b″. During breathing they are in constant motion. Now the question answered so variously is, How should the manometer be read? Should one read in this case negative pressure 5, the figure to which the left column rises; 2, the lowest mark above zero that it reaches; 10, the difference between the tops of the two columns when at their maximum, or 4, the difference between them when they are at their minimum? Or, as some have suggested, should one read the averages: half the difference of the maxima or 5, or half the difference of the minima, or 2? Or should one read half of the oscillation between the maximum and minimum on one side of the manometer, in this case 3.5? Or finally, should this figure be doubled, making the reading 7? Such is the confusion of possibilities that present themselves to some minds.



Pneumothorax manometer: 1, ordinary manometer; 2, capillary link; 3, tube leading to manometer.

Of course there can be but one correct reading. Physics has long ago made clear that the pressure is measured by the column of fluid supported. Now the column supported is that portion of the longer column above the top of the shorter. The correct maximum reading in the given example is therefore negative 10, while the correct minimum reading is negative 4; but under these conditions some might read maxima and others minima, so we still have something to agree on. It is suggested that the mean pressures be recorded. In this case the mean pressure is negative 7.

I wish now to call attention to an attachment for the manometer which I discovered, by means of which the mean pressure can be read directly, a means of practically obliterating the oscillations, thus giving a positive-reading manometer for mean pressures. If this attachment were generally adopted differences in readings would vanish. The attachment is inexpensive, easily constructed, and applicable to any manometer. It is shown in Figure 2.

A capillary tube is fixed in a heavier tube (for protection) so that the pressure must pass through the small opening, *c*. This device is placed in one limb of the divided tube that leads to the manometer, as shown in Figure 3. When the rubber limb, *T*, is pinched off, forcing all pressures to reach the manometer through the link *L*, positive mean pressures will record with practically no oscillations; but the oscillations are necessary to prove the position of the needle. If tube *T* is left open oscillations occur as usual. Thus both uses of the manometer are readily available.

1. The following reviews of the cases may be found: Ophüls: Jour. Exper. Med., vi. Brown, P. K.: California State Jour. Med., December, 1906, p. 324. Brown, Philip King: Coccidioidal Granuloma, THE JOURNAL A. M. A., March 2, 1907, p. 743.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. ITS ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

BACILLUS OF BORDET-GENGOU VACCINE.

Sophian-Hall-Alexander Laboratories, Kansas City, Mo.

Whooping-Cough Vaccine (Bordet-Gengou Bacillus).—This vaccine is prepared from the Bordet-Gengou bacillus derived from a case of whooping-cough. Marketed in ampoules containing respectively 100 million, 350 million and 500 million killed Bordet-Gengou bacilli.

Therapeutics

BRASS-FOUNDERS' OR ZINC AGUE

This not infrequent and often unrecognized condition has been carefully investigated by Dr. Emery R. Hayhurst of Chicago.[1] Men who are exposed to the fumes of molten metals are more or less likely to become poisoned. With lead and mercury this has long been recognized. Perhaps there is no poisoning from pure molten iron or copper, but some one or more elements in brass, bronze, German silver, etc., may cause a peculiar condition termed "brass-founders' ague," and Hayhurst's investigations have shown that the more the fumes are inhaled, the more likely is this ague to occur; the more confined the room the more likely is it to develop. This is noticeable from the greater number of cases of poisoning in the winter than in the summer months when the windows and doors are open, and the weaker an individual, the more liable is he to have it.

Brass, it may be remembered, is composed of copper and zinc. The zinc often predominates, as it is the cheaper of the two metals. Bronze is a mixture of copper and tin.

1. Hayhurst, Emery R.: Am. Jour. Med. Sc., May, 1913, p. 723

While those who inhale the fumes of these metals when molten are most likely to be poisoned, those who are subjected to the dust from polishing or handling them (especially when the metals have become oxidized or carbonized) are also likely to have poisoning, although perhaps not so severe. They may have gastric disturbances, irritation and inflammation of the gums, and perhaps some forms of eczema.

The most important symptom of brass-founders' ague is the chill, with more or less fever and then sweating. With some persons this chill may occur shortly after inhaling the fumes, while others may withstand such inhalations until the latter part of the day, or may regularly be tolerant to a certain number of inhalations a day; but even in cases in which such tolerance is found, the person may have a chill if these fumes are repeated often during the day.

Besides the symptoms already mentioned, the mouth and throat are dry, there is more or less dry cough, a feeling of tightness in the chest, a metallic taste in the mouth and loss of appetite; nausea and vomiting may or may not occur; headache is generally present and sometimes severe backache and leg pains. With more or less lengthy prodromes a chill generally develops, and the patient may be chilly for from one to three hours. He is not readily warmed, even with blankets and hot-water bags, although hot drinks are a comfort to him. The pulse-rate is generally greatly increased. There is not always a rise of temperature before the crisis and the development of perspiration. With the perspiration comes prostration, weariness and drowsiness, and the patient sleeps. The attack may last, says Hayhurst, from five to twenty hours. When the patient recovers from the attack, which is more or less like a malarial chill and fever, he is pretty well, except that he may feel somewhat weary and may not have his usual appetite. Hayhurst says that the urine invariably shows albumin and casts after a severe chill. This soon clears up. No changes in the blood have been noted.

These chills are more likely to occur in the latter part of the afternoon, in other words, after more or less repeated or prolonged exposure to the fumes or dust of the metals; they may not occur, however, until the cool of the evening when the chilling seems to precipitate the ague.

Hayhurst's investigations seem to show that about 70 or 80 per cent. only of the workmen in these occupations are susceptible to the poison and experience the chills; hence, there must be some natural immunity. A tolerance also occurs in from 70 to 75 per cent. of the men who work steadily at the trade. The other 25 per cent. are poisoned more or less regularly, but rarely sufficiently to cause a change of occupation. Weak and anemic persons and women are more susceptible to the poisoning than the stronger men.

Investigations have shown that men in these occupations are more or less addicted to alcohol. This is largely owing to the belief that whisky especially is an antidote against this form of poisoning. Investigations have also shown that these men do not live so long as men in many other occupations, and the mortality from pulmonary tuberculosis is much greater than in most occupations.

Although it has not been definitely shown that it is the zinc which causes this kind of poisoning, it is quite probable that zinc is the metal.

Since treatment in these cases is not satisfactory, no specific treatment having been discovered, prevention is of more than usual importance. It is self-evident that in the manufacture and the handling of these metals and combinations of metals, factories and furnaces should be so equipped that the dust will not be inhaled, and the fumes should be sucked up the chimneys by fans and blowers so that it will be impossible for the workmen to inhale them. While sponges and various respirators have been used over the nostrils and mouth, resort to such measures should be necessary only in individual instances. Women and boys should probably not be employed in these industries; their general health should certainly be considered and anemic persons and those with a tendency to tuberculosis should be refused acceptance as employees in factories of this kind. Much on the plan of those who handle lead, frequent baths should be taken, the hands should be thoroughly washed before eating, and the workmen should not eat in the foundries.

The only symptomatic treatment advisable seems to be hot drinks, sometimes emetics and the administration of hot milk. Of course, if there is severe pain, a hypodermic of morphin must of necessity stop it, and theoretically would be good treatment. More or less all these patients probably need iron and bitter tonics.

While no distinct pathologic condition is known to follow these acute poisonings, repetitions of the poisoning or continued exposure to the cause, whether dust or fumes, sooner or later allows respiratory, urinary, or perhaps nervous disturbances to develop. Instances of neuritis have been known to follow such poisoning.

LEAD-POISONING

In communities in which there are industrial plants handling lead, poisoning from this source is frequent. It has been shown that the most poisonous or the most soluble forms of lead are not necessarily the most likely to cause accidental poisoning. Those that most readily form dust seem to be most harmful, the more the dust is abolished, therefore, in all forms of lead factories and lead industries, the less the poisoning. There is no question, of course, of the danger of lead fumes from molten lead.

The subject of industrial lead-poisoning has been carefully investigated by Dr. Alice Hamilton[2] of Chicago. She came to the conclusion that the most poisonous of the lead salts is probably the suboxid which forms on the surface of melted lead, is given off in fumes at high temperatures and also rubs off on the hands of the lead-workers; it is this salt that causes poisoning in smelters, molders, type-setters, plumbers and others. The other forms most likely to cause poisoning are litharge or oxid of lead, and then the higher oxids of lead, as red lead, and the carbonate of lead, or white lead. Those who clean or scrape off lead paint, and also painters, are likely to have poisoning from white lead. Lead-poisoning occurs frequently in factories in which men work in white lead, and in oxid of lead or red lead, and Dr. Hamilton finds that those who work in red lead are poisoned sooner than those who work in white lead.

She believes that a weak sulphuric acid lemonade, which workmen were urged to drink, is not a protective against lead-poisoning. It has been proved that most forms of lead will be so acted on by the gastric juice during digestion that some lead will be absorbed. The only harmless lead seems to be the sulphid of lead. A recent article of Drs. Carlson and Woelfel[3] reports the results of a special investigation as to the solubility and

2. Hamilton, Alice: Industrial Lead-Poisoning in the Light of Recent Studies, THE JOURNAL A. M. A., Sept. 7, 1912, p. 777.

3. Carlson, A. J., and Woelfel, A.: The Solubility of Lead Salts in Human Gastric Juice and Its Bearing on the Hygiene of the Lead Industries, THE JOURNAL A. M. A., July 19, 1913, p. 181.

absorption of the different kinds of lead. This investigation was made at the request of Dr. Alice Hamilton.

The amount of lead necessary to cause poisoning varies greatly, probably according to idiosyncrasy, some persons being susceptible, others being tolerant. Some artisans, therefore, may work in lead for years without evidence of poisoning, while others can work but a few weeks before poisoning is apparent. Investigations in some of our factories, Dr. Hamilton says, showed that from 25 to 35 per cent. of the employees had some form of lead-poisoning. Negroes seem more susceptible to lead than white men, and women are probably more susceptible than men. Fatigue, improper housing and insufficient food all render the individual more susceptible to lead-poisoning and its anemia, as we would logically conclude. Those who drink much alcohol are more susceptible to the poisoning, and the tendency to drink beer or whisky in order to remove the sickish, disagreeable, sweet taste from the mouth due to the lead salts that are inhaled or swallowed is great with men in these employments. Women, on the other hand, drink a good deal of tea, or crave sour things, to overcome this disagreeable taste.

It has not been shown that lead is positively absorbed from the skin, or that much is absorbed when inhaled into the lungs; probably most of the poisoning is caused by lead being swallowed into the stomach.

The diagnosis of chronic lead-poisoning is sometimes difficult, and for that reason every one should be questioned as to his possible exposure to lead, after other more tangible causes are excluded, if he loses appetite, is pale or anemic, is constipated and suffers from indigestion. These are all prodromal symptoms. The blue line on the gums may or may not be present. If the teeth and mouth are properly cared for the blue line is probably not often found. "The basophilic granulation of the red cells," which was thought at one time to be diagnostic of chronic lead-poisoning, has been shown not to be pathognomonic. Lead may or may not be found in the urine of patients who show other signs of lead-poisoning; therefore its absence will not exclude lead-poisoning. It has been suggested, in cases in which the patient is working in lead and poisoning is suspected, that a soluble sulphid be rubbed on the skin, on the theory that lead is excreted through the skin, and that if a black precipitate is formed, it will show that there is lead in the tissues.

Dr. Hamilton concludes that, although one attack of acute plumbism is not serious and may leave no diseased condition, one attack does predispose to another, and that probably a man who has had one attack of acute colic, for instance, or of wrist-drop, certainly should be ordered to stop working in lead, and that the employer should refuse him employment. The later pathology of chronic lead-poisoning becomes that of cardiovascular-renal disease on the one hand, or progressive anemia, weakened muscles, especially the extensors, tremor and emaciation.

In this anemia nucleated red corpuscles are almost always found, even if the anemia is not profound.

Lead colic may occur suddenly, or after protracted constipation, with or without gastro-intestinal pains. During the paroxysm the patient generally vomits, the pulse is slowed and the blood-pressure is generally raised. Nothing will stop this kind of pain but large doses of morphin, used in combination with atropin. Hot fomentations to the abdomen should be used, or better, if the patient is able, a hot bath should be taken. As soon as the pain is less severe the patient should receive a saline cathartic, and best perhaps Rochelle salt, as, in spite of the usual innocuousness of magnesium sulphate, it should not be forgotten that, occasionally, if magnesium sulphate does not cause purging and is absorbed, it can cause nervous depression not dissimilar to that which may occur from lead.

The after-treatment of lead-poisoning of this nature, or if chronic lead-poisoning is diagnosed without lead colic occurring, is a daily morning dose of Rochelle salt or something similar and the administration of small doses of sodium iodid. The dose of iodid should, as a rule, be small, not more than 0.20 gm. (3 grains) three times a day, after meals, as large doses may cause more lead in the system to become soluble than is desired, and more acute symptoms of lead-poisoning to occur. Anything that builds up the nutrition is also good after-treatment for chronic lead-poisoning; for example, the administration of small doses of iron, and the prevention of high blood-pressure and a possible beginning cardiovascular-renal disease.

If lead palsy, which in its most frequent form is wrist-drop, is present, the tonic treatment mentioned before should be carried out with the addition of strychnin and the use of electricity and massage.

Acute cerebral symptoms not infrequently occur. These symptoms may be a delirium, convulsions, epileptiform in character, or more or less coma. Occasionally hallucinations and insanity are caused by the action of lead on the brain. These conditions are all exceedingly serious. While wrist-drop is generally curable, more profound paralysis of the arms and legs is much more serious.

Prevention, of course, should be considered by every employer and should be understood by every employee who has anything to do with industries that make or handle lead. The prevention of lead-poisoning is much the same as previously described in the prevention of zinc ague, and a patient who has once been poisoned by lead should either leave his occupation or should inaugurate such means of prevention of future poisoning as are efficient. Personal cleanliness is one of the greatest factors in the prevention of lead-poisoning.

The Bureau of Labor[4] at Washington has issued a bulletin which describes the causes and prevention of lead-poisoning both in Europe and this country, representing the investigations of Oliver in Europe and of Alice Hamilton and John Andrews in this country.

4. Bulletin 85, Bureau of Labor, Washington, 1911.

Infection of Swimming-Pools.—Most modern swimming-pools have certain provisions which aim to prevent the contamination of the water. At many of the swimming-pools, the walks are so constructed that any water splashed on them drains away from the pool; expectoration in the pool is prohibited and nude bathing for men is the general rule. At many places each bather is required to take a preliminary bath before entering the water, but unless a conscientious attendant is constantly on duty this preliminary bath may be very superficial with many of the bathers. Medical examination of the persons using the pool, is required in some cases, but such examinations are usually made at such infrequent intervals as to provide only a small measure of safety from infection. Of the thirty-five swimming-pools reported by Mannheimer, at only twenty-three medical examination was made before a person was permitted to use the pool, and with very few exceptions no subsequent medical examination was made. At only eleven of these pools was there any inspection of those entering, and at only one was every one required to pass through the shower-room on the way to the pool.—Clark and Gage in *Bull. Mass. State Board Health.*

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THE SIGNIFICANCE OF FORMIC ACID IN THE URINE

It would work a great step in advance in our understanding of the chemical processes of the organism and unquestionably render much assistance in the interpretation of the various perversions of the nutritive functions if all the important steps in the life-processes of the body were adequately known. The discovery and recognition of these intermediate stages is rendered peculiarly difficult owing to the fact that many of the products which unquestionably arise as transition fragments in the destruction of larger nutrient molecules escape detection because they are themselves speedily further altered by oxidation, reduction or other chemical reactions, until step by step the end-products are reached without the disclosure of any of the transitory stages. Only when some of these evanescent intermediate compounds crop out by accident, as it were, are we made to realize that they are incidents in the story of degradative changes in living organisms.

The present research in metabolism is particularly concerned with the appreciation of such intermediary products and the processes by which they arise. Accordingly one reads more frequently than formerly of lactic acid and the various ketone compounds, acetone, diacetic acid, beta-oxybutyric acid, of hydroxyacids and ketonic acids all brought into growing prominence by the newer point of view which is being presented. This phase of physiology, full of the promise of revelations in respect to the detailed chemical workings of the body, is still in an early state of development. The novelties of the subject are still brought to our notice in isolated instances. Formic acid, for example, has lately commanded attention as a possible transition product. Its comparatively simple chemical structure, H.COOH, at once suggests plausible relationships to all the familiar foodstuff radicals. The fact that small amounts of formic acid are now known to be excreted constantly in the urine makes it appear not improbable that this substance may be formed in the body as an intermediate product of oxidation in large amounts, of which only a very small proportion escapes complete oxidation and is excreted.

Dakin, Janney and Wakeman[1] have started a search for the source of the formic acid which escapes through the kidneys. Some conception of the quantitative relations involved may be gained from the analyses of normal human urines of persons on mixed diets. The formic acid content ranged from 30 to 118 mg. per day, with an average excretion of 60 mg. It is in part of endogenous origin, the output falling during starvation to about one-third the normal amount.

The excretion of formic acid is greatly increased when carbohydrates are given. It is known that many intestinal micro-organisms may not only ferment, but also produce formic acid from both carbohydrates and proteins.[2] Accordingly it might be assumed that the formic acid of the urine has its ultimate source in products of alimentary bacterial activity. This explanation is rendered less tenable by the fact that a marked increase in the urinary output was found to follow the intravenous injection of glucose into the organism. Protein feeding is attended with a similar but smaller increase in formic acid output. Such findings, therefore, point to this compound as a product of the intermediary metabolism of both carbohydrates and proteins. The chemical analogies between some of the processes and products of fermentation and metabolism are constantly being reasserted.

CANCER STATISTICS

The formation of committees and other agencies for the study of cancer in many countries is leading to the collection of data that are of much interest and also in all likelihood of great significance.

As frequently noted, statistics in general seem to reveal an increase in cancer; but whether this may not be the outcome of greater accuracy in diagnosis is a question concerning which there is still a difference of opinion. Obviously, on the basis of the figures and facts now available, the solution of the question as to whether or not cancer is on the increase is most difficult. In the future the conditions for reliable comparisons will be more satisfactory.

The reports on cancer statistics coming from different countries are sometimes so much at variance as to suggest either that the mode of life and external conditions must play a large part in cancer or that the statistics given do not represent the true state of affairs. One example of this discrepancy may be cited. It is generally believed that cancer affects women much more frequently than men. Statistics from England and other countries indicate that it is so; but in Norway this does not seem to be the case.

Soegaard's[1] recent analysis of the statistics gathered in Norway by the Norwegian cancer committee reveals

1. Dakin, H. D., Janney, N. W., and Wakeman, A. J.: Studies on the Conditions Affecting the Formation and Excretion of Formic Acid, Jour. Biol. Chem., 1913, xiv, 341.
2. For literature on this point see Steppuhn, O., and Schellbach, H.: Ueber die Ameisensäure als Zwischenprodukt der tierischen Zuckerspaltung, Ztschr. f. physiol. Chem., 1912, lxxx, 274.
1. Soegaard: Die Krebsformen Norwegens, Ztschr. f. Krebsforsch., 1913, No. 13, p. 89.

conditions in that country which are highly remarkable. In the first place the figures show a greater number of men to have cancer than women. The difference in favor of men is not large—of 37,046 deaths from cancer during 1865-1895, 18,413 were in men and 18,633 in women, who constitute 51.5 per cent. of the Norwegian population—but the point is that here the conditions noted in many other countries appear to be reversed. The Norwegian statistics also show a preponderance of cancer of the stomach, which is not the case in statistics from other countries. In a series of 9,528 deaths from cancer, 5,990, or 62.9 per cent., were caused by cancer of the stomach. For the ten years 1896-1907 following the period covered by this series, there were 19,263 deaths in Norway due to cancer, of which 12,582, or 65.3 per cent., were from cancer of the stomach. In the province of Nordland there were 1,235 deaths from cancer during 1896-1907, of which 913, or 73.9 per cent., were from gastric cancer. Another remarkable feature of the Norwegian statistics is the comparative infrequency of cancer of the female genital organs in Norway. The highest percentage of any district is only 8.3 per cent., while the lowest is 2.2 per cent. In considering this unusually low percentage Soegaard suggests that the explanation may be the small amount of gonorrheal infection in the Norwegian women.

We see then that the statistics from Norway, evidently gathered with great care and under favorable conditions, differ in three distinct points from the other figures: They show a greater frequency of cancer in men, a greater frequency of cancer of the stomach, and a comparative infrequency of cancer of the genital organs of women. What can this mean? Either that statistics are at fault or that social and other conditions play a decisive part in the development of cancer. If the latter is the case, which seems reasonable enough, the fundamental importance of accurate statistical studies of cancer under different conditions is self-evident. If these studies reveal that in certain countries, communities or districts there prevails cancer of certain organs or of certain types, then the next step would be to discover and eliminate the conditions on which the prevalence depends. There is great need in this country for the accurate study of cancer from this angle.

THE ITINERANT QUACK

The man who comes to the small town with a cheap stock of shoddy clothes, rents a store for a few days or weeks, and by means of flamboyant advertising disposes of his worthless goods to the "suckers" of the locality is looked on by reputable business men as a detriment to the community. Decent men of the town recognize that while the owner of the store rented and the proprietor of the local newspaper may make a little money out of the visit of the fly-by-night merchant, the town as a whole is the worse for the visit. So generally is this admitted that most towns and villages impose a heavy tax on undesirable citizens of this type.

The itinerant quack bears the same relation to the community as the transient clothing-store proprietor, with this difference: while in the one case the unsophisticated are relieved of their money without getting value received, in the other, they also run the risk of losing their health as well. The business men of country towns, however, do not so easily recognize the harm that the traveling doctor does as the damage that the traveling merchant causes. One reason for this is, of course, the fact that the traveling quack is not a competitor of the local business man. Should the local physicians protest, their objections are discounted on the ground that it is a case of "professional jealousy." Rural towns, however, are gradually waking up to the fact that the visit of the itinerant doctor is just as much a calamity as the visit of the itinerant merchant. And, naturally enough, the editors of the country newspapers are among the first to call public attention to this fact. We say naturally because the men editing the country newspapers are, as a class, among the leaders of thought in their communities. From a selfish point of view, the local newspapers might be expected to be the last ones to have anything detrimental to say about the class that brings in a handsome advertising revenue.

The *New Teller* is published at York, Neb. It received an offer of an advertisement from a Dr. A. A. Potterf of Kansas City, who was going to pay a visit to York in the hope, doubtless, of catching some persons who think that their home physicians know less than traveling quacks. Of course the editor did not know that Dr. A. A. Potterf was a graduate of a low-grade homeopathic school that is now out of existence; that while the doctor has been practicing medicine for a quarter of a century he is so little known in his home town that reputable physicians of Kansas City have never heard of him; that in spite of his alleged qualifications, he is not a member of the county or state medical societies. The editor of the *New Teller* did not know, and could not be expected to know, these things; but he did know that physicians who are above the average in knowledge and skill do not go quacking it around the country. Knowing this the *New Teller* published the following open letter on the front page of its issue of July 30. It is worth reading:

"*Dear Doctor:*—Your ad. copy and express money order received. We regret very much that you contemplate another visit to York in the near future. We regret just as much not being able to keep the money order—it looks good to us. However, the *New Teller* has managed to struggle along several months without any such advertisements. We are mercenary enough to indulge in the hope that you will file your certificate with the county clerk, and pay the small fee required by the law, though this little matter is as a rule neglected by the traveling fraternity of your calling.

"Owing you no personal enmity, we can't help expressing the wish that the city of York might find some way to benefit by your stay in this city to the extent of at least fifty dollars a day. Not so long ago, an itinerant pedler might rent a

store-room in York, put in a cheap stock of overalls, gilt watches, and in the course of ten days wind up with an auction sale. This proceeding would now cost him too much.

"You may be a good doctor—a most excellent doctor. As such you might build up a lucrative practice in Kansas City and be saved the toils and hardships incident to constant traveling. [A delightful piece of gentle sarcasm.—ED.] There are already many good doctors in York—plenty, in fact. As they make their homes here, the people have a fair chance to judge them. The people don't have a fair opportunity to become acquainted with you. We believe this community would be as well off without the visits of 'United Doctors,' 'Doctor Specialists,' and the like, and have said so in a variety of ways. We believe the person with defective eyesight should consult an oculist, rather than patronize a spectacle pedler. If pedlers we must have, let them aid materially in cutting down the heavy burden of the taxpayers.

Very respectfully,

THE NEW TELLER.

"The above letter also applies to 'The Old Reliable State Medical Institute' of Omaha, which forwards ad. copy under date of July 29, announcing a three days' visit to York. The Institute may be old and it may be reliable. It may be several other things. It should be remembered that a quack doctor is more dangerous and vastly more expensive than patent medicines. The public is now protected to a certain extent against the latter."

Could the facts be stated more simply or more accurately? A letter like this makes the readers of the newspaper think, and quackery cannot thrive among people who think! Some day it will dawn on the public generally that the doctor who can treat any kind of ailment a little better than the general run of doctors does not need to spend money advertising that fact, nor is it necessary for him to assume "the toils and hardships incident to constant traveling!"

THE NATURE OF GENERAL PARALYSIS

The most important advance in our knowledge of general paralysis since its relation to syphilitic infection became generally accepted is the demonstration by Noguchi and Moore[1] of *Spirochaeta pallida* in the brain of paralytics. That their failure to find the spirochete in more than about 25 per cent.[2] to a large extent depended on technical reasons is indicated by the results obtained by Levaditi, Marie and Bankowski.[3] These investigators, using other methods (Fontana, etc.) and examining each cerebral convolution systematically, were able to demonstrate the spirochete in the brains, freshly obtained, from eight of nine cases of typical general paralysis. By the silver method the spirochete was found in only one of the nine cases. It is of importance that in all of the eight positive cases death occurred in a paralytic or apoplectiform attack, whereas in the negative case it occurred as the result of general enfeeblement.

Here, then, is full confirmation and extension of Noguchi and Moore's work. On the basis of their observations, the French workers formulate the etiology and genesis of general paralysis as follows: The disease is the result of the proliferation of the spirochete in the cerebral cortex and of the acute and chronic lesions thus produced. This proliferation occurs in successive crops and in varying localizations, most frequently in the anterior parts of the brain. As the proliferation in one focus ceases, and the parasites die, another may begin in a hitherto intact convolution, thus explaining why a distinct and advanced lesion may not contain large numbers of parasites. Probably the apoplectiform attacks characteristic of general paralysis are connected in some way with proliferative climaxes on the part of the spirochete, particularly when located in motor zones. At any rate the parasite appears to be easy of discovery in the cases in which death occurs in the apoplectiform attack.

General paralysis, then, is the result of actual syphilitic infection of the brain. This knowledge will stimulate the efforts to find some way of arresting this infection, even if it may be impossible to restore the affected parts to their normal state. Efforts will be made also to delve deeper into the nature of locomotor ataxia.

1. Noguchi and Moore: Jour. Exper. Med., 1913, xvii, 232. Spirochaeta Pallida in the Brain in General Paralysis, editorial. THE JOURNAL A. M. A., March 29, 1913, p. 1002.
2. Noguchi: München. med. Wchnschr., 1913, lx, No. 14.
3. Levaditi, Marie and Bankowski: Ann. de l'Inst. Pasteur, 1913, xxvii, 577.

COLD STORAGE AND THE FOOD-SUPPLY

Now that the cold storage business has become a permanent feature of the American food industries, it is a public duty to investigate the varied aspects of this mode of preservation with a view alike of correcting its shortcomings and developing its possibilities. In many quarters the manifold aspects of cold storage and its practical applications to human health and nutrition have not as yet received the serious consideration which the magnitude of the interests involved warrants. Figures sometimes serve as a stimulus for a better appreciation of the facts of commerce and the progress of science. A government report[1] is authority for the statement that the estimated receipts into cold storage during one year amounted in round numbers to 131,000,000 pounds of fresh beef, 20,000,000 pounds of fresh mutton, 176,000,000 pounds of fresh pork, 157,000,000 pounds of butter, and 10,000,000 cases of eggs. It appears that 3.1 per cent. of a year's production of fresh beef, commercial slaughter, goes into cold storage; and the data for the other meats furnish even larger figures. Of the farm and factory production of butter during a year, 9.6 per cent. goes into cold storage, and of the farm and non-farm production of eggs, 15 per cent. The wholesale value of the fresh beef, mutton and pork received into cold storage totaled $35,000,000; of butter, $40,000,000, and of eggs $64,000,000.

Influences of such magnitude bearing directly on so vital a matter as the food factor in national welfare assuredly cannot be overlooked by those interested in the public health. Inasmuch as some of the abuses or

1. Holmes, G. K.: U. S. Dept. Agric., Bur. Statis., Bulls. 93 and 101. See also Exper. Sta. Rec., 1913, xxviii, 868.

objectionable features of cold storage have centered in the unduly prolonged retention of food products, with the consequent possibility of deterioration and incipient decay, instead of perfect preservation, it is interesting to learn in an authentic way something about the actual periods of time during which the food products have in the past actually been subjected to the conservation processes by cold storage in practice. It appears that the receipts into cold storage are entirely or very nearly exhausted by the deliveries within ten months. Very small percentages of some of the commodities were stored for a much longer time, but these are explained by warehouse men as being caused by special circumstances of an uncommercial nature.

The largest "carry-over" into the second year of storage of the six products investigated has been in the case of dressed poultry, that of eggs being decidedly the lowest. For the average length of time in cold storage the actual costs are surprisingly small, being reported as ranging from a fraction of a cent per pound for meats to 3.5 cents per dozen for eggs—figures representing only a small percentage of the wholesale price of the commodities. If the service thus rendered is a wholesome one, its operations involve a reasonably economical expenditure. In so far as cold storage involves merely a readjustment of price levels, its regulation is a matter of public concern; but that is quite aside from the real hygienic problems concerned therein. We quote the conclusion of the government expert: "Let the fact be what it will with regard to the effect of cold storage on prices, the fact remains that cold storage has been of incalculable benefit to consumers in providing commodities for consumption out of the natural productive season."

SPLENECTOMY AND THE METABOLISM OF IRON

Leon Asher of Berne and his collaborators have devoted considerable attention to the relation of the spleen to the metabolism of iron.[1] It appears from their researches that after removal of this organ from the body, iron is no longer retained as effectively as by the intact organism. There is an augmented continued loss of the element with the feces, an observation that has been confirmed in the case of splenectomized man.[2]

One gains the impression from the studies on record that the spleen is in some way concerned with the conservation of iron. This is strengthened by the added fact that young spleenless animals kept on a diet deficient in iron exhibit a far greater diminution of red blood-cells and hemoglobin than do the normal young of the same species. There is no evidence of an undue destruction of blood elements, for a liberal supply of iron is all that is necessary to develop normal blood conditions even in the absence of the spleen.[3]

1. Functions of the Spleen, editorial, THE JOURNAL A. M. A., Oct. 26, 1912, p. 1546.
2. Bayer, R.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., xxi, 338; xxii, 111, 532.
3. Vogel: Biochem. Ztschr., 1912, xliii, 386.

Dr. Pugliese[4] of Milan has proceeded with the experimental analysis of this peculiar function of the spleen. Interrelations between the liver and spleen have been asserted to exist. The Italian physiologist has therefore investigated the secretion of bile in the same animal before and after splenectomy. The volume of bile secreted after removal of the organ is, if anything, increased; but the output of iron in the fluid is noticeably diminished thereby. This is explicable in the light of the diminished iron content of the liver that may be expected in persons losing undue amounts of iron with the feces. Pugliese has further demonstrated a diminution of the iron in the blood, along with the decrease in erythrocytes and hemoglobin, in the early period after splenectomy. This does not persist very long, however, before a recovery of normal conditions in the blood ensues. The facts confirm what we have earlier pointed out, namely, that with a suitable diet the nutritive outcome of splenectomy need not be in any way unfavorable.

4. Pugliese, A.: Neuer Beitrag zur Physiologie der Milz; das Eisen der Galle und des Blutes bei entmilzten Tieren, Biochem. Ztschr., 1913, lii, 423.

Current Comment

"SCORING" THE MILK SELLER

We recently discussed some of the factors which demand consideration in the present attempts to improve the quality of the milk-supply to cities, and offered some comment on the limitations which affect the producer.[1] A still different aspect of the subject has been raised by the investigator in charge of the market-milk investigations of the Bureau of Animal Industry.[2] He remarks that it has been a too prevalent custom in the past to lay all of the blame for dirty milk on the shoulders of the milk producer. While this may be an easy and convenient way, he adds, to shift the burden of responsibility from city to country, it is apt not only to hurt the dairy industry unfairly, but to close the eyes of reformers and health authorities to questions that lie nearer home. Milk inspection, to be complete, must apply to the places and modes of delivery quite as well as to the farm and its environment.

Precisely as systems of "scoring" dairy farms have been planned and are actually in operation as a basis for selling graded milk, so it is now proposed to devise a scheme of inspection and method of control for the stores and distributing plants concerned in the milk industry. There is the widest variation in the practices now prevalent in our American cities. In some there is rigorous control exercised by efficient health authorities, under whom a "license" or a "permit" carries with it an assurance of reliable supervision. In other places there are dead-letter regulations or no laws whatever. There are communities in which the sale of milk in bulk is forbidden; elsewhere it is freely tolerated.

1. Financial Factors in the Milk-Supply Problem, editorial, THE JOURNAL A. M. A., Aug. 9, 1913, p. 415.
2. Kelly, E.: The Control of Bulk Milk in Stores, Twenty-Eighth Annual Rep., Bur. Animal Ind., Washington, 1913, p. 237.

The conditions essential for the preservation and delivery of milk in a sanitary condition are now well known in a professional way. It is perhaps not too early, therefore, to bring pressure to bear at every point at which a violation of the necessary provisions spells failure. To attempt to "standardize" stores handling milk and to rate them in the public eye along the lines which are followed by the inspectors who safeguard the sources of supply of cities like New York, may be premature in 1913. High ideals are worth striving for. It is not difficult to educate an interested public by a system of propaganda. Drastic ordinances cause unnecessary hardships and friction. The fortunate community is one that succeeds in securing cooperation at every step, first by inculcation and then by liberal enforcement of reasonable measures.

MEANING OF THE WORD "CURE"

Recently we commented on the misinformation frequently given the public through the newspapers by the incorrect translation of the word "cure" or *Kur* from medical reports in foreign languages.[1] Another instance of the mistranslation of the word "cure," which in foreign tongues means only care or treatment, is taken from an item in an Italian medical journal on the subject of large medical fees. The item cited refers to the late J. P. Morgan, and a portion of the original item showing the use of the word "cure" may be quoted in the original Italian:

Le quattrocentomila lire di compenso fissate ai medici che *curarono* Morgan durante l'ultima sua malattia fanno ricordare altri casi di colossali onorari a sanitari illustri.

This is the way it was translated:

The $80,000 awarded to the physicians who cured J. P. Morgan during his fatal illness brings to mind other large fees paid to illustrious members of the medical profession.

CONSCIENCE AND VACCINATION

To any one to whom figures mean anything or who is willing to accept the absolutely undoubted results of experience, vaccination as a preventive of small-pox is an established fact. If the good of the whole people is to be regarded as a principle of disease prevention as it is in other matters of government, then vaccination should be universally compulsory. That it is not so is a reflection on the good sense and good judgment of enlightened people. We find, however, that in such a well-governed country as Great Britain, where vaccination may almost be said to have originated, or at least where it was placed on a definite basis by the discovery of Jenner, vaccination is still a matter of conscience. That is, anyone who asserts that he has conscientious objections to vaccination may be permitted to set aside the regulations of the health authorities, which would protect everybody from a loathsome disease like small-pox. As set forth in a recent number of the London *Times* in reply to a parliamentary inquiry, Mr. Burns, president of the Local Government Board, furnishes figures which show, thanks, perhaps, to the unintelligent agitation of the antivaccinationists, that the percentage of persons exempted from vaccination on account of conscientious objections as compared with the total number of births from 1907 to 1912 increased from 6.3 per cent. in the former year to 17.3 per cent. in 1908 and thence rapidly to 31.6 per cent. in 1912. The tolerance of a privilege which permits one out of three persons practically to nullify the effect of a proved preventive health measure is an absurdity in this day, and will merely result in a large measure in return to the horrible small-pox conditions of former days in Great Britain. The prevalence of small-pox in the United States during the past year is no doubt due to the absence of strict regulation in regard to vaccination, the lax enforcement of regulations already provided or the total ignoring of these regulations. The matter of vaccination should nowhere depend on any sort of objections of an individual, but should be determined solely by scientific and statistical knowledge.

1. "Kur" and "Cure," editorial, THE JOURNAL A. M. A., April 26, 1913, p. 1308.

THE "COLLOIDAL NITROGEN" OF THE URINE

Almost from time immemorial the urine has been called on to bear the burden of many of the uncertainties that are involved in the subtle and ever-changing art of diagnosis. Color and consistency, odor and transparency, have been clothed from time to time with some unique temporary significance that has been dispelled in turn with the progress of investigation. When real knowledge is wanting, the distinction between the initiated and the novice, the bona-fide student and the impostor is not always easily drawn.

It is a common experience to find new "discoveries" invested with some unusual import. We recall the controversy which centered about the alleged finding of "ureine" as a significant constituent of the urine a few years ago. Now this hypothetic substance has completely lost its identity and the name itself is probably unrecognized by the student of to-day.

A few years ago considerable was written regarding what was called the "colloidal nitrogen" of the urine. This expression was derived from the observation[1] that when urine is concentrated the addition of alcohol gives rise to a precipitate which contains organic nitrogen in the form of compounds non-diffusible (like colloids) and presumably of high molecular weight. The possibility of their being protein derivatives, polypeptids or nitrogenous carbohydrates was suggested. From a quantitative point of view the proportion of nitrogen present in the urine in this form was at best very small. Not a little significance was attached to the finding that the maximum amount of "colloidal nitrogen" found in normal urines never approached the minimal figures for this substance in the urine of individuals suffering from carcinoma. Much of the interest in this fact has now been dispelled by the demonstration[2] that the "colloidal nitrogen" is largely, if not entirely derived from the precipitation of the familiar uric acid and purin bases to which traces of urea, ammonia and other normal urinary constituents adhere.

1. Salkowski, E.: Berl. klin. Wchnschr., 1905, Nos. 51, 52; 1910, Nos. 12, 38, 50.

2. Thar, H., and Beneslawski, J.: Zur Frage nach der chemischen Zusammensetzung des nach dem Zinkverfahren hergestellten sog. "Kolloidalen Stickstoffs" aus normalem Menschenharn, Biochem. Ztschr., 1913, lii, 435.

THE PATHOGENESIS OF ARTHRITIS

There is food for thought in a paper by Beitzke which reports the results of a study of the joints in two hundred necropsies in the Pathology Institute at Berlin.[1] This work was the continuation of a study carried out in the same laboratory by Rimann which had disclosed that in the bodies of one hundred persons, in age ranging between 15 and 80 years, alterations were visible in the knee-joints of no fewer than sixty-seven. This surprisingly large incidence of joint changes in persons not considered to be arthritics is more than corroborated by Beitzke's investigation. He examined in two hundred bodies not only the knee-joints, but also the joints at the base of the great toes and often the hip-joints and shoulder-joints, finding in this series but thirty-five who did not have lesions in at least one of these joints. Of the total number there were six cases of ordinary arthritis deformans and in sixteen there were some evidences of gout, so that of 178 bodies of persons without these typical joint diseases there were macroscopically visible changes in the joints in at least 113. The lesions varied from areas but a few millimeters in diameter in which the cartilage was thinned and degenerated, up to erosive changes destroying practically all the cartilage, associated with fibrotic alterations in the underlying bone tissue. Essentially there is no difference between these lesions and those of atrophic arthritis deformans, and the conclusion seems warranted that they are the result of the trauma of every-day life from which all persons suffer, and that they constitute a *locus minoris resistentiae* which determines the action of bacterial products, or of the bacteria themselves, in persons suffering from chronic infections. They are present alike in the two sexes, and increase in frequency with age, the figures being 60 per cent. in persons from 20 to 40 years old, 95 per cent. between 40 and 50 years, and practically 100 per cent in older persons. In these findings a ready explanation is seen of the great frequency of arthritic disease, and it becomes easy to understand why an infectious process in the tonsils, the prostate or the gall-bladder is so likely to cause trouble in remotely located joint surfaces.

1. Beitzke, H.: Ueber die sog. Arthritis deformans atrophica, Ztschr. f. klin. Med., 1913, lxxiv, 215.

Medical News

ILLINOIS

New Officer.—Marion County Medical Society at Rainey's Lake, August 22: Dr. E. C. Alvis, Kell, secretary, vice Dr. F. M. Phifer, Centralia, resigned.

State Conference of Charities.—The eighteenth annual State Conference of Charities and Correction will be held in Rockford, October 11-14. A. L. Bowen, Springfield, is secretary of the conference.

Tuberculosis Dispensary Opened.—The Champaign County Anti-Tuberculosis Health League has established a dispensary in the Imperial Building, for tuberculosis only. The dispensary will be in charge of physicians of Champaign and Urbana, and patients will be received between 1 and 2 p. m., on Monday, Wednesday and Friday.

Notice of Examination.—A special examination will be held by the State Board of Health for all physicians, eligible under the law of July 1, 1899, in the Coliseum Annex, Wabash Avenue and Sixteenth Street, Chicago, beginning September 24, at 9:30 a. m. No one will be admitted to the examination unless he presents a card of admission which will be issued to any applicant whose application is received on or before September 16. Application should be made to the Acting Secretary of the State Board of Health, Springfield.

Additions to University Faculty.—The following appointments to the faculty of the University of Illinois were announced by the president, August 26: Dr. Albert C. Eycleshymer, St. Louis, professor of anatomy and head of the department of anatomy of the medical school; Dr. Richard Rupert, Chicago, instructor of anatomy; Dr. George P. Dreyer, Chicago, professor of physiology and head of the department of physiology, school of medicine; Dr. Bernard Fantus, Chicago, professor of pharmacology; Dr. Edgar Grim Miller, Columbia, Pa.; Dr. J. Craig Small, Chambersburg, Pa., and Dr. H. N. Walker, Harrisburg, Pa., assistant professors of physiologic chemistry; Dr. Edgar D. Coolidge, Chicago, professor of materia medica and therapeutics; and Dr. Louis Schultz, Chicago, assistant professor of oral surgery and pathology.

Personal.—Dr. Perry H. Wessels, Jr., has been reappointed city physician of Moline.——Dr. John P. Benson, Joliet, has been appointed physician at the State Penitentiary.——Dr. J. S. Mason has been elected president, Dr. A. Darwin Kirby, vice-president and Dr. W. M. Honn, secretary of the medical staff of the Julia F. Burnham Hospital, Champaign.——Dr. Paul Sherman, Shawneetown, has been appointed inspector of the State Board of Health.——Dr. and Mrs. W. Grant Hatch, Rockford, sailed for Europe, September 3.——Dr. Anna Dwyer, Chicago, has been appointed a member of the State Charities Commission, vice Dr. John T. McAnally, Carbondale, resigned. ——Dr. William Barnes, Decatur, is convalescent after an operation for appendicitis.——James Mullenbach has been appointed superintendent of the Cook County Institutions, Oak Forest.——Dr. George S. Rainey has been elected a member of the Common Council of Salem.——Dr. J. L. Aleshire, Plainville, was operated on for appendicitis August 11, and is doing well.——Dr. G. F. Tyson, Evanston, has started for Europe.——Dr. J. F. McCutchan, Alexis, celebrated his eightieth birthday anniversary, August 9.——Dr. Mathilda Freitag, Savage, was stricken with appendicitis while traveling in Holland, recently, and was operated on, and is reported to be making satisfactory progress toward recovery.

Chicago

Physician Exonerated.—Dr. A. E. Ludwig, charged with having caused the death of Mrs. Marie Lucas through an operation, was exonerated by the coroner's jury, August 14.

Health Commissioner to Handle Garbage Plant.—Dr. George B. Young, commissioner of health, has been placed in charge of the new city garbage reduction plant to be acquired from the Chicago Reduction Company under the ordinance recently passed.

MASSACHUSETTS

Personal.—Dr. Arthur Allison Howard has been appointed physician-in-chief of the Hospital for Children and of the Children's General Outpatient Department of the Boston Dispensary, succeeding Dr. William Palmer Lucas, resigned.——Dr. John H. Cain has received the appointment of postmaster at Lexington.

Harvard Expedition Successful.—The expedition sent out by Harvard Medical School for the investigation of tropical diseases, consisting of Drs. Ernest E. Tyzzer, Richard P. Strong, Manila, P. I., and C. J. Bruce, has returned after a successful trip. The party spent three weeks at Guayaquil, Ecuador, and the remainder of the time in Peru, where they made especial studies of tropical diseases.

School for Health Officers.—Beginning with the fall term, Harvard University and the Massachusetts Institute of Technology intend to maintain in cooperation, a school for public health officers, the object of which is to prepare young men for public health work and especially to fit them to occupy administrative and executive positions such as those of health officers or members of boards of health, secretaries, agents and inspectors of health organizations. The requirements for admission are that graduates of colleges and scientific schools who have received adequate instruction in physics, chemistry, biology and French or German may be admitted to the school. The medical degree is not the prerequisite for admission. The administrative board which will conduct the new school is composed of Prof. William T. Sedgwick, Dr. Milton J. Rose-

nau and Prof. George C. Whipple of Harvard. Each student who satisfactorily completes the course in the school will be granted a Certificate of Public Health signed by the presidents of both institutions.

MICHIGAN

New Officers.—Upper Peninsular Medical Society at Ishpeming, August 6-7: president, Dr. H. J. Hornbogen, Marquette; vice-presidents, Drs. George G. Barnett, Ishpeming, and C. F. Moll, Kenton. Houghton was selected as the meeting place for 1914.

State Farm for Epileptics.—The Governor, the Secretary of the State Board of Corrections and Charities and the State Health Officer recently looked over the proposed site for the new epileptic colony near Ann Arbor. The new institution will be on the lines of a colony settlement and segregation will be one of the principle factors.

Personal.—Dr. Angus McLean, Detroit, has returned from Europe.——Dr. W. S. Mackenzie has succeeded Dr. Clifford C. Kirkpatrick as local surgeon for the Wabash System at Adrian.——Dr. R. W. Hodges, Freda, has succeeded Dr. W. D. Whitten as surgeon at the Baltic Mine and Dr. H. D. Cornell, Victoria, has been appointed surgeon at Freda. Dr. Whitten will locate in Southern California.——Dr. R. D. Sleight, Battle Creek, has returned from Europe.

MINNESOTA

Tax Assessed on Physicians.—On the assumption that physicians have money in the form of bonds, stocks and notes, the Ramsey County Board of Equalization has directed the county assessor to assess every physician whose name appears in the city directory, from $500 to $1,000 for moneys and credits.

The Vincent Plan.—President Vincent's plan to readjust the university clinical staff at the city and county hospital, St. Paul, was considered by the Board of Control, August 18. Under the proposed plan, the university staff will concentrate its work in the period of six months and according to the superintendent of the hospital, the plan can be put into operation without making any very radical changes.

Personal.—Dr. L. M. Brunet, Duluth, has resigned as agency physician at Nett Lake and will resume practice in Superior, Wis.——Dr. B. E. Hempstead, Duluth, has started for Europe. ——Dr. William D. Kelly, St. Paul, has succeeded Dr. John T. Rogers as chief of the staff of the city and county hospital and Dr. Frederick E. Leavitt has been elected secretary of the staff.——Dr. E. W. Buckley, St. Paul, has been elected supreme physician of the Knights of Columbus.

MISSOURI

Personal.—Dr. J. R. Ernest, Kansas City, Kan., has been appointed surgeon in the United States Coast and Geodetic Survey service.——Dr. George H. Jones, Kansas City, has been appointed State Bacteriologist, vice Dr. M. C. Stone, Jefferson City, resigned.——Dr. R. O. Lieuallan, Mercer, has succeeded Dr. A. H. Vandivert as assistant physician at State Hospital No. 2, St. Joseph.——Dr. E. H. Trowbridge, assistant physician at State Hospital No. 2, St. Joseph, has been appointed assistant superintendent for the Minnesota School for Feeble-Minded and Colony for Epileptics at Faribault.——Dr. J. F. Binnie, senior attending surgeon to the Kansas City General Hospital, has resigned.

St. Louis

Sanatorium Fund Nearly Ready.—There is only needed $2,872 to complete the $50,000 fund necessary to secure for the Missouri Baptist Sanatorium, the subscription of $100,000 made by the late A. D. Brown.

Leper Escapes.—George A. Hartman, who was examined and pronounced a leper several weeks ago and was assigned to the Carter Camp 14 miles south of St. Louis, escaped for the second time in three weeks, August 27.

Hospital Library Plan.—The City Hospital Board has taken up the matter of installing a medical library at the city hospital for the benefit of its interns. A part of a fund of $500 is said to be available for this purpose, and contributions of books have been offered by members of the staff and others.

NEBRASKA

Hospital Notes.—Germans of Omaha propose to build a new hospital and deaconess home in that city. The hospital work will be in charge of the German Samaritan Hospital Association, an interdenominational organization which includes all the German churches in the city.——Ground was broken recently at Hastings for the Mary Lanning Hospital which is to be erected by W. H. Lanning in memory of his daughter. ——Although the last legislature appropriated funds for a new building at the Norfolk State Hospital to relieve the present crowded conditions, no action has yet been taken by the Board of Control.

Personal.—Dr. W. D. Guttery, Pilger, has been appointed superintendent of the State Hospital for the Insane, Norfolk. ——Dr. E. M. Whitten, Nebraska City, is reported to be seriously ill.——Dr. Amy R. Robinson, Hastings, who has been seriously ill with ptomaine poisoning, is said to be convalescent.——Dr. R. L. Ivins, Harrison, has returned from Omaha, convalescent, after an operation for the removal of the appendix.——Dr. H. R. Carson has been appointed first assistant physician at the State Hospital, Norfolk, and Dr. R. H. Foster, Omaha, has been made second assistant physician.——Dr. Nellie G. Carr, Deffenbaugh, Grand Island, has been appointed superintendent of the State Tuberculosis Hospital, Kearney. ——Dr. LeRoy Crummer, Omaha, has returned from Europe. ——Dr. W. H. Wilson, Table Rock, has been reappointed state health inspector.——Dr. Elmer R. Porter, Omaha, has recovered $1,190 for medical services rendered the late Anna Williams. His original claim was for $5,000.

NEW YORK

New York City

Another Decrease in Infant Death Rate.—The figures for the infant mortality for the week ending August 23, showed a decrease from the number of deaths reported for the corresponding week of 1912. There were only 340 deaths as compared with 350 for the corresponding week of last year. The reductions were in Brooklyn and the Bronx.

Atmospheric Conditions in City Schools.—The report of the Committee on School Inquiry of the Board of Estimate and Apportionment has been submitted by Prof. Charles Baskerville and Prof. C. E. A. Winslow who worked with Prof. Paul H. Hanus of Harvard in making the investigation. Some of the conclusions reached were that some of the best and some of the worst ventilated schools were fan-ventilated and that the whole problem rested on the skill with which the fan system was operated. It was found that the air in the schoolrooms investigated was good in so far as dust was concerned, the number of bacteria, moulds and microbes being small. In regard to temperature it was found that out of 1,800 determinations only 14 per cent. were over 71 degrees F., indicating that overheating is rare. In about one-sixth of the schoolrooms investigated the conditions were distinctly bad, but this was due to the carelessness of janitors and the interference of teachers rather than to construction. It was found that air conditions in the night-schools were not as good as in the day-schools, owing to the fact that the ventilating systems frequently are not operated at night.

Court Upholds Oral Agreement.—In January last Dr. James P. Tuttle, since deceased, operated on James R. Keene, the latter dying the same day. Dr. Tuttle then presented a bill to the estate for $5,200, which he said was in accord with an oral agreement with the patient. The executors of the Keene estate claimed that the bill was excessive, but permission has been granted by the court to settle with Dr. Tuttle's estate for $4,000.

Personal.—Dr. Louise Pearce of the Johns Hopkins Hospital has been appointed as assistant to Dr. Simon Flexner at the Rockefeller Institute for Medical Research.——Dr. and Mrs. Theodore C. Janeway, Dr. William L. Culbert and Dr. Howard Fox, have recently returned from Europe.——Dr. Lester M. Hubby and Dr. Emil Frei of Brooklyn have sailed for Europe.

NORTH CAROLINA

Physician Acquitted.—Dr. E. A. Hennessee, Glen Alpine, who killed a man in a street duel a few months ago, was tried last week and acquitted. Dr. Hennessee himself sustained several injuries including a penetrating gunshot wound of the lung.

Personal.—Dr. Platt W. Covington, formerly of Wadesboro, who has been doing acceptable work in the hookworm department of the State Board of Health for two years past has been placed in charge of the newly created Board of County Health with headquarters in the department of Public Health, Raleigh. The aim of this department is to care for and develop interest in county health work throughout the state and especially to facilitate health work in those counties where a whole-time health officer is in charge.——Dr. S. Westray Battle, Asheville, has sailed for Europe.

OHIO

New Hospital for Port Clinton.—Dr. Henry J. Pool has purchased the Carrothers residence on East Second Street, Port Clinton, and has converted it into a private hospital.

Physicians Named for Poor.—Safety Director Mooney, Toledo, has announced the appointment of the following twelve physicians to render aid to the indigent poor: Drs. Geo. L. Chapman, Helen M. Nolen, W. E. R. Schottstaedt, James G. Cullen, Dalton Kahn, Leo S. Talaska, James C. Price, Emily C. Willoughby, Edwin C. Ballinger, Robert E. Lawless, Frank C. Titus, and Charles H. Ferguson.

Personal.—Dr. H. L. Sanford, Cleveland, has been appointed member of the Board of Health vice Dr. J. E. F. Cogan, retired.——Dr. Wm. L. Neville, Lima, has been appointed a trustee of the Lima Hospital, succeeding Dr. F. M. Hassey, Sidney, who was recently appointed superintendent of the institution.——Dr. Wm. R. Dabney, Marietta, is said to have become demented while performing an operation in Dayton, October 12, and to have been committed to Longview Asylum, Cincinnati.——Dr. and Mrs. Tenney, Toledo, have sailed for Europe.——Dr. Charles S. Means, Columbus, is reported to be ill with typhoid fever.

PENNSYLVANIA

Campaign Against Quacks.—The York County Medical Society has started a campaign against quacks, a committee on illegal practice having been appointed with instructions to proceed with prosecutions against alleged offenders.

Typhoid Fever in the State.—Typhoid fever has again appeared at Royersford, seven cases having been reported within the past week. Many cases of typhoid have been reported throughout the outlying districts of Winslow.

Personal.—Dr. John W. Phillips, Troy, has sailed for Europe.——Dr. J. T. Eckert, Allentown, suffered a fracture of both clavicles by the overturning of his automobile, recently. ——Dr. John A. McKenna and family, Landsdowne, sailed for Europe, August 9.——Dr. and Mrs. Charles S. Rebuck and son, Harrisburg, have returned from Europe.

Hospital News.—The bids for the erection of the new Hospital for the Insane of Westmoreland County were opened August 12. The lowest bid was $331,200.——The bids received for the construction of St. Mary's Hospital, South Scranton, were all above the figure which the hospital could afford to pay, and further progress in the matter has been deferred indefinitely.

Philadelphia

Increase in Typhoid.—Seventy-four new cases of typhoid with ten deaths were reported to the Bureau of Health for the week ended August 30, an increase of 25 over the preceding week.

Baby Saving Show at Public Disposal.—After October 1, the Baby Saving Show will be removed from its present quarters in the City Hall and placed at the disposal of the public. In order to place the exhibit before the parents of the city, the Child Hygiene Association has asked that applications for the show in different neighborhoods be sent in as soon as possible.

Little Mothers' Clinics.—The success of the Little Mothers' Clinics held at the mission house at Tenth and Kimball Streets, proved by the attendance of more than fifty little Italian girls carrying their small charges at the third clinic and their interest in the instruction given. The ages of the children ranged from 5 to 8 and they were in charge of Dr. Mary Fallon.

Public Works Department to Ask City to Build Garbage Plant.—At the next meeting of the City Council, Director Cooke of the Department of Public Works, will submit plans and estimates for a city garbage plant. The complete proposition includes: Construction of municipal garbage reduction plant with collecting equipment to cost approximately $1,000,000. Abolition of pigs and piggeries within the city limits. Use of closed metal garbage cans by every householder in the city. Since 1905, the city has spent nearly $4,000,000 for the collection and disposal of its garbage and there have been complaints and protests from all parts of the city of the lax and irregular collections.

Personal.—Dr. George P. Mueller has been elected professor of surgery in the Philadelphia Polyclinic, succeeding Dr. Lewis W. Steinbach, deceased.——Dr. Mary W. Griscom sailed for Europe, September 2, en route to Korea by way of Siberia. ——Dr. J. William White sailed for Europe August 16 and will be abroad for eight months, returning by way of China. ——Dr. William Gautner of the Philadelphia Hospital for the Insane, has been appointed assistant physician at the new State Hospital, Pottsville.——Dr. George C. Signor has been elected superintendent of the Eastern Pennsylvania Institution for the feeble-minded and epileptics, near Spring City, vice Dr. H. M. Carey, resigned.——Dr. Henry F. Page, medical superintendent of the German Hospital, was seriously injured by being thrown from a carriage in a runaway near Bangor, Me.——Dr. Eric S. Wiseheart, for two years senior house physician at the Presbyterian Hospital, has resigned to enter practice in Snow Hill, Md.

WASHINGTON

Harvard Professor in Seattle.—Dr. Joel E. Goldthwait, Boston, a member of the faculty of the Harvard Medical School, was the guest of the King County Medical Society, Seattle, at luncheon, August 12, and addressed the organization on the subject of "Visceral Ptosis."

Personal.—Dr. W. E. Cass, Vancouver, has been appointed superintendent of the Northern Hospital for the Insane, Cedro-Woolley.——Dr. E. W. Fell, Medical Lake, has been appointed assistant physician of the Elgin (Ill.) State Hospital.—— Among those in attendance at the seventh annual pilgrimage of the mountaineers in the Olympian mountains, were: Drs. F. W. Griener, Ballard, and N. P. Wood, Seattle.

WISCONSIN

Will Select Site for Camp.—The State Forester and Dr. J. W. Coon of the State Tuberculosis Sanatorium, Wales, have been authorized by the State Board of Control to select a site in the Forestry Reserve for an experimental tuberculosis camp.

Tuberculosis Notes.—The revised plans for the proposed municipal hospital at Waukesha call for an expenditure of about $12,000. The institution will accommodate from fourteen to sixteen patients.——Drs. D. R. Connell and H. C. Maurer, Beloit, have purchased the old St. Mary's Hospital building in that city and will, it is expected, open a hospital in the near future.——At the semi-centennial celebration of the Milwaukee Hospital, it was announced that a gift of $100,000 had been made to the institution by Mr. Frederick Layton.

Personal.—Dr. Edward Kremers, Madison, had conferred on him the honorary degree of D.Sc. by the University of Michigan, Ann Arbor, recently.——Dr. Frank I. Drake, Madison, has been elected physician of the State Penitentiary, Waupun, vice L. Rock Sleyster, who has been made superintendent of the State Hospital for the Criminal Insane.——Dr. H. A. Norden has resigned as health officer of Sturgeon Bay, to accept the position of superintendent of the Chicago-Winfield Tuberculosis Sanatorium, near Chicago.——Dr. Belle P. Nair, Fort Atkinson, has been appointed resident woman's physician at the Northern Hospital for the Insane, Oshkosh.——Dr. Leopold Schumacher, first assistant on the medical staff of the University of Wisconsin, in charge of students' health, has resigned and will practice in Chattanooga, Tenn.

GENERAL

Tuberculosis Sunday.—The National Association for the Study and Prevention of Tuberculosis announces that Sunday, December 7, has been designated as the fourth annual tuberculosis day at which special efforts will be made through churches and otherwise to interest the people in this most important subject.

Bequests and Donations.—The following bequests and Donations have recently been announced:

Industrial School for Crippled and Deformed Children, Boston, $30,000. Children's Hospital, Boston, $10,000. Boston Home for Incurables, Boston Dispensary, Boston Nursery for Blind Babies and the District Nurses' Association, each $5,000 by the will of Amos Cotting, Boston.

Pottsville (Pa.) Hospital, $30,000 by the will of Mrs. James Muir.

Chautauqua County Tuberculosis Hospital, $150,000 by the will of Mrs. Elizabeth M. Newton, Fredonia, who died recently in California.

Gorgas to Go to Africa.—In despatches from Johannesburg, South Africa, under date of August 14, it is stated that Colonel William C. Gorgas has received an invitation from the Chamber of Mines, Johannesburg, to visit South Africa, study the sanitary conditions in the Witwatersrand mines and to make suggestions as to their improvement. The special object of the conference is the prevention of epidemic pneumonia of a very fatal type among the blacks such as occurred

several years ago among the negro laborers at Panama and was successfully handled by improvement of the sanitary conditions. Colonel Gorgas has accepted the invitation subject to the approval of the United States Government, and has applied for leave of absence of four months to enable him to make the journey and complete the research required.

Library of Radiographs.—An attempt is being made to establish, at the Army Medical Museum, Washington, D. C., an extensive library of lantern and stereoscopic slides of radiographs, representing the work of radiographers who have done particularly notable work along certain lines. Enough slides have already been received to make the collection of value for reference and for teaching purposes at the Army Medical School. Those who have already contributed to the collections are Dr. Lewis Gregory Cole, New York City, slides of stomach, lung and kidneys; Dr. William H. Dieffenbach, New York City, slides of diseases of bones; Dr. Kennon Dunham, Cincinnati, Ohio, stereoscopic slides of the lungs; Dr. Walter C. Hill, Cleveland, Ohio, slides of diseases of bone; and Dr. James T. Case, Battle Creek, Mich., slides of the alimentary tract. Others have promised to send slides, and it is the intention to add to the collection from time to time as important work is done. The collection is available for study by any civilian practitioner on application to the curator, Army Medical Museum, Washington, D. C.

Would Transform Battle Ships into Sanatoriums.—At the closing session of the Fourth International Congress of School Hygiene in Buffalo, August 29, the following resolutions were offered by Dr. S. Adolphus Knopf, New York City, and were adopted without discussion:

WHEREAS, Nearly a million tuberculous children or children simply predisposed to tuberculosis are attending our public schools, and there is hardly accommodation for 1,500 to receive instruction in the open air; and

WHEREAS, The Congress is convinced that the open air school is one of the most powerful agents in the prevention and cure of tuberculosis in childhood, and it has been furthermore demonstrated that nearly all climatic conditions, providing the air is dust-free, lend themselves to the prevention of tuberculosis in the predisposed and the cure of the afflicted; and

WHEREAS, Statistics show that there are not nearly enough hospital and sanatorium accommodations for adults and children afflicted with pulmonary tuberculosis or children suffering with tuberculous joint or bone diseases; and

WHEREAS, It has been demonstrated in New York and other cities that discarded vessels lend themselves admirably to transformation into all-year-around hospitals and sanatoria for consumptive adults, sanatoria for children afflicted with joint and other types of tuberculosis, and into open air schools for tuberculous, anemic, and nervous children; and

Resolved, That the Fourth International Congress on School Hygiene petitions the United States government to place at the disposal of the various States of the Union as many of the discarded battleships and cruisers as possible to be anchored according to their size in rivers or at the seashore and to be utilized by the respective communities for open air schools, preventoria, sanatorium schools for children, or hospital-sanatoria for adults. Be it further further

Resolved, That the Congress expresses its appreciation to the Italian government of the example it has given by consecrating three of its discarded men of war to the combat of tuberculosis. Be it further

Resolved, That this Congress expresses the sincere wish that other governments may fellow the example of Italy; and be it finally

Resolved, That copies of these resolutions be presented to the American and other governments represented at this Congress.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, August 15, 1913.

Personal

Dr. Lacassagne, professor of legal medicine at the Faculté de médecine de Lyon, who is well-known as the founder and director of the *Archives d'anthropologie criminelle*, has just retired. His place is taken by one of his pupils, agrégé E. M. Martin.

The death of Dr. Bourget, professor of clinical medicine and internal pathology at the Faculté de médecine de Lausanne, is reported.

Irradiated Vaccines

At one of the last sessions of the Académie des Sciences, Dr. Maurice Renaud read an interesting paper on the irradiation of bacteria and irradiated vaccines. He found that bacteria exposed to the radiation from a quartz lamp with mercury vapor are deprived of all their biologic properties while they keep their histochemical properties, and in particular their toxicity. If in man or in animals irradiated cultures of pathogenic microbes are injected, no infectious disease results. Moreover, the inflammatory phenomena at the point of injection are usually insignificant, and the bacteria disappear from the tissues with remarkable rapidity. This resorption creates a condition of intoxication which leads to immunization with appearance of antibodies in the body fluids. Because of these properties of irradiated bacteria it occurred to Renaud to utilize them as vaccines. For two years he has used them for preventive and therapeutic immunization in men, and they have given him, especially in the cases of the staphylococci, streptococci, gonococci, etc., results much superior to those of vaccines obtained by the coagulating action of heat or of chemicals.

Measures against Typhoid Fever

The minister of the interior has just sent to the prefects a circular inviting them to make public in their departments the advantages of the two antityphoid vaccines which have been authorized by a recent decree and which are prepared respectively in the laboratory of Professor Chantemesse at the Faculté de médecine at Paris and in the laboratory of antityphoid vaccination of the Ecole d'application de médecine et de pharmacie militaires at Val-de-Grace. When cases of typhoid fever which seem likely to give rise to an epidemic occur, the various health officials and the mayors are to place at the disposal of physicians the necessary supply of either vaccine. The minister of the interior, moreover, recommends to the prefects to have the water supply improved hereafter if necessary.

Protection of Women Before and After Childbirth

A woman employed by a merchant brought suit against her employer for $40 (200 francs) for not having given her back the position which she held before the birth of a child. The employer maintained that he owed his former employee at most only a week's wages in lieu of notice. The court, however, held that under the law of November 27, 1909, the woman was entitled not only to the ordinary indemnity for dismissal but also for damages.

Examinations for the Doctor's Degree

Up to the present a medical student who has failed in an examination may present himself for the same examination at the end of three months. A recent decree provides that after four failures on the same examination the candidate may not try again for two years.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, Aug. 22, 1913.

Personal

Honorary Professor Goldmann, head surgeon at the Deaconess House in Freiburg, died, August 11, aged 51. Goldmann, who was for many years assistant to Professor Kraske, was a capable investigator who had particularly of late years received general recognition for his researches on vital staining.

Professor Bardenheuer of Cologne died, August 13, at the age of 72. He was one of the most noted surgeons of Germany. His scientific labors were performed especially in the field of fractures and dislocations. His method of treatment by permanent extension has become general. He has also published important contributions in many other fields of surgery. In "Deutsche Chirurgie" he wrote the section on injuries of the extremities. In 1889 he published a manual on the treatment of fractures and dislocations by means of extension (Leitfaden der Behandlung der Frakturen und Luxationen mittels der Extensionsbehandlung).

The Future of the Berlin Krankenkassen

The new imperial insurance law to which I have repeatedly referred requires one general local Krankenkasse in every city so that marked changes must be made in the organization by Jan. 1, 1914, when the new law goes into effect. Many of the other kinds of insurance organizations such as the trade societies, the Innungskrankenkassen, the free aid societies, will be absorbed by the future consolidated local societies.

At present there are in Berlin 54 local societies with about 600,000 members, 69 trade societies with about 165,000 members, 19 Innungskrankenkassen with about 60,000 members and 20 free aid societies with about 35,000 members. According to the new arrangements the membership of the

consolidated local society will increase from about 90,000 to about 400,000 and probably will exceed a half million. It is clear that with these extensive changes the relations of physicians will also be disturbed.

As a number of Krankenkassen with free choice of physician are to be dissolved, the number of physicians engaged in insurance work will be materially diminished. On the other hand there will be an increase in the extent of the limited free choice of physician, by which under certain conditions a fixed number of physicians do the work of the societies among whom the insured have free choice. The mass of the insured laborers will secure an advantage from the new organization because, on account of the increased membership of the single societies, these may extend their operations and because there will be less frequent changes of membership in the societies on account of change of occupation, changes which naturally occur much more easily with a smaller membership. At present negotiations are under way between the representatives of the insurance physicians and of the Krankenkassen to secure an agreement on a satisfactory basis between the various interests.

Further Reduction of the Prussian Birth-Rate

The latest statistics show a decline of the birth-rate, the births being 3,156 less than the previous year, a reduction of 1.1 per cent. A reduction in the excess of births over deaths is averted by the fact that the exceptional mortality of 1911 was not repeated in 1912. An increase in the number of marriages is also to be noted.

Increase in Cancer

Recent statistics show a constantly increasing proportion of deaths from cancer, the mortality in 1911 being nearly five thousand more than in 1907. More men than women and more married than single fall victims to the disease. The increase with advancing age is marked. The increase in the mortality per ten thousand is as follows: 1907, 6.57; 1908, 6.60; 1910, 7.04, and 1911, 7.28. The proportion among men rose from 6.03 in 1907 to 6.64 in 1911, and among women from 6.57 to 7.28. Among the unmarried in 1911 there were only 1.09 deaths from cancer per ten thousand living, while among the married the figure was 12.29; among the divorced, 24.09, and among the widowed, 41.79.

Mental Diseases and Occupation

The National Statistical Bureau at Karlsruhe has caused a statistical investigation to be made with reference to the occupations followed by the persons who were admitted to the national sanatoriums and asylums of the grand duchy of Baden during the seven-year period from 1904 to 1910. These statistics include 15,980 insane persons above 16 years of age, of whom 8,678 (54.3 per cent.) were male and 7,302 (45.7 per cent.) were female.

The principal result is a confirmation of the prevailing view that persons engaged in intellectual occupations are chiefly exposed to the danger of mental disease. Of the 15,980 patients, 3,278 belonged to agricultural and forestry employments (1,867 males and 1,411 females); 6,159 persons were employed in trades (3,997 males and 2,162 females); 2,404 in commerce (1,485 males and 919 females); 1,351 (683 males and 668 females) in the so-called free professions (clerks, officials, artists, etc.).

For every thousand persons belonging to a particular employment, there were in June, 1907, 7.8 insane (9.4 males and 6.3 females) in agriculture and forestry; in trades 12.1 (13.9 males and 10.2 females); in commerce 14.7 (18.5 males and 11.0 females), and in the free professions 16.5 (13.3 males and 19.6 females).

From these relative figures it is plain that of all professions, those engaged in agriculture and forestry are least in danger of mental disease. The most liable to mental disease are those belonging to the so-called free professions. Men in all departments of industry are more exposed to mental disease than women, with the exception of the free professions, in which the proportion of the female sex (19.6) is far in excess.

If household servants are excluded, the following picture presents itself: 7.4 out of every thousand of those actually engaged as independent workers in the agricultural and forestry profession, 13.1 per thousand of those engaged in trades, 19.2 of those engaged in commerce, and 22.5 of those in the professions are subject to mental disease.

The danger of mental disease is much less for those who are subordinate workers in each occupation: In agriculture, 5 per thousand; in the trades, 12.9 per thousand; in commerce, 12 and in the free professions only 10.3 per thousand of the employees were subject to mental disease, with males predominating.

There were admitted to the sanatoriums in the period from 1904 to 1910 on account of alcoholic insanity or of chronic alcoholism, a total of 1,030 men (1.6 per cent.), and 89 women (0.1 per cent.); on account of paralysis, 748 men (1.1 per cent.) and 216 women (0.3 per cent.); on account of neurasthenia, 324 men (0.5 per cent.) and 43 women (0.1 per cent.); on account of epilepsy 681 men (1 per cent.) and 191 women (0.3 per cent.). This finding corresponds to the well-known fact that the male sex is exposed to a much greater extent than the female to the danger of alcoholic excess and the results of venereal infection (progressive paralysis) and the danger of over-exertion in mental work and neurasthenia.

The number of independent male workers affected with alcoholism increases to 6.1 per cent. in the commercial class in which the inn-keepers and saloon-keepers are included; 23 men, including 13 physicians, were admitted to these institutions on account of addiction to morphin or similar narcotic poisons. Paralysis and neurasthenia are prominent, totaling 3.3 or 1.3 per thousand of those engaged among government employees, professional persons and artists and particularly among those who are independent workers.

Among the women admitted, simple mental disturbance was the most prominent (6,003 cases, or 9 per cent.). This is explained by the well-known greater tendency of the female sex to emotional disease (melancholic depression, maniacal excitement, etc.), as well as to hysteric affections. Among simple mental disturbances are reckoned also the mental affections which occur in connection with reproduction (pregnancy, labor and the puerperism).

Organization of School Physicians in Würtemberg

The institution of school physicians has been extended throughout Würtemberg by a new law. The superior medical officer *(Oberamtsarzt)* is to be court physician, vaccinator and school physician. He will be charged with the care of the health of the pupils as a principal part of his duties. The school physician must at least once a year visit every school during the instruction period alternately in the summer and winter sessions. He must report on the grounds and the plan for new buildings and for changes in school buildings, as well as the oversight and use of these buildings and their apparatus with reference to their sanitary conditions, attend to the position of the school desks and arrange for seating the pupils according to height and capacity for hearing and seeing, as well as for the position of the body, and supervise the cleanliness of the pupils, carry out sanitary requirements in the instruction, secure a hygienic arrangement of the course of study and test the character of the materials for instruction as well. During the first year he must examine all newcomers and record his findings on a health card supplied for each child. The card contains a personal record of the child and questions to the parents with regard to previous illness. The health cards have a uniform form for the entire country.

The examination of pupils includes the general physical condition, the nervous system, the condition of the ears, eyes, nose and mouth, the chest and its contents, the skeleton, especially the vertebrae, and the limbs. Examinations which require the removal of clothing may not be undertaken in the case of girls, if any objection is raised by those responsible for their education. In any case, a female teacher must be present at such examinations. The examination may be omitted if a card properly filled by a licensed physician is presented at the right time. A similar examination must take place in the fourth and seventh or eighth school years, and also in all schools for boys before the final examination. In the later examinations, the extent of development of the body during the school period must be determined. Suitable advice as to the choice of trade must be attached to the certificates of all children dismissed from school who do not seem entirely healthy. Pupils with pathologic changes must be examined oftener. The parents must be given a statement of the findings. Treatment is not afforded, but in case the pupil is needy, report is made to the authorities. The health cards are kept until the twenty-fourth year. In the schools for technical training there is no supervision by a medical school inspector as a rule. In the normal schools, kindergartens, etc., only an

inspection of the schoolrooms and the pupils, without a thorough personal examination.

In Würtemberg there are sixty-four superior districts with about 350,000 children who would be examined by the school physician. The Würtemberg government contemplates in time making the superior medical officers full-time officers and for this purpose to put two superior districts into one. Then each school physician would have about 11,000 children to examine.

Disinfection of Railway Cars

In Potsdam there is an installation for the disinfection of railway cars which so far as I know has not its equal anywhere else. A second institution of the kind is being built at Frankfort-on-the-Main. The principal feature of the entire arrangement is an iron tunnel more than 23 meters (70 feet) long and 5 meters (16 feet) in diameter. It is reenforced with fourteen rings about 6 feet apart. Two iron doors close the tunnel, one of which is fast and the other movable. The front movable door easily slides aside and then the car which is to be cleansed is run on rails into the tunnel. Board runways on the sides of the iron walls enable the workmen to gain access to the car in order to make the necessary preparations. Tubes of various kinds open into the interior. One serves to introduce steam, and another removes air by suction. In addition there are wires for the conduction of electricity.

When the car is properly prepared, the tunnel is closed up air-tight. One man can regulate the iron door with ease. The apparatus is soon made air-tight. In the nearby power-house the pumps begin to work and draw out the air in the apparatus. When a vacuum has been produced the pressure on the door is 4,142,000 kg. At the same time the warming of the apparatus to from 50 to 60 C. (from 122 to 140 F.) is shown by the thermometer and barometer, which are introduced into the interior and which show their condition by electric indicators in the power-house. The machinist knows at every moment exactly what the temperature and pressure are in the interior of the disinfecting apparatus.

The car stands for fully five hours in the air-exhausted apparatus, which has a weight of 135,000 kg.

Heat and steam are not the only means employed. By a special process vapors of formaldehyd are generated in the interior of the car to be disinfected. So thorough are these vapors of formaldehyd that they correspond to the most exacting requirements of the imperial health office. Bacteria very tenacious of life enclosed in tubes and sunk deep into the upholstering are completely devitalized.

Two cars at a time can be thoroughly cleansed and disinfected in this apparatus. Care is taken that the foul air probably contaminated with bacteria does not reach the free air. It has to pass through a furnace where it is burned. From all parts of the empire cars are brought to Potsdam in order that they may be restored to service after a most thorough cleansing. Such a cleansing costs only $5 (20 marks), whereas formerly $50 (200 marks) were required. The Postdam installation cost about $20,000 (80,000 marks).

VIENNA LETTER

(From Our Regular Correspondent)

VIENNA, August 15, 1913.

The Report of the Lupus Institute in Vienna

The ravages of lupus have for a considerable time caused appreciable damage to national welfare, so that the action of Professor Lang in establishing a special lupus clinic met a need which was universally felt. This pioneer of surgical treatment of lupus had the satisfaction of witnessing the excellent work done by this, his foundation, as published in the yearly reports of the institute. It has been in existence only three years, and yet 2,061 patients have been treated, as Director Jungmann states in the report for 1912. This figure includes about 15 per cent. coming from Australia, India, Egypt and the United States, for the reputation of the institute is already wide-spread. Of the patients applying for help 561 were treated by excision and cured permanently. The other chief factors of treatment were the Finsen light and the Roentgen rays. The institute has given to 605 patients Finsen treatment consisting of 211,622 single sittings. The trouble and time, apart from the expense, involved by this method is very large, and therefore the treatment by Roentgen rays is preferred in suitable cases because it acts quicker and necessitates less expenditure. Within the last few months the effects of radium were tried with excellent results. It is necessary to subject the diseased parts to prolonged exposures to the active rays, but then it is the best method of actinic treatment. Altogether, 610 patients received 11,764 treatments of radium, and 935 persons 8,060 Roentgen-rays treatments. As yet surgical treatment, in suitable cases, is still the best method for a complete and rapid cure. The institute is owned by the state, and this explains the difficulties encountered at the beginning of its existence.

The Number of Students of the Austrian Universities in the Summer Term, 1913

The last (summer) term of the school year 1912-1913 has again brought an increase in the numbers of students attending the lectures of the universities. Altogether 27,299 students matriculated, which is an increase of 2.8 per cent. over the corresponding period last year. The increase in 1912 over 1911 had been 5 per cent. In the year 1913, 8.2 per cent. of the total number of matriculated students were women, their number having grown 5.5 per cent. Of the sum total, 21 per cent. were medical students, among them 410 women. It is interesting to note that the proportion of medical students among women is about equal to the figures for men—20 per cent. As regards the promotion or graduation of students in the last year (1912-1913), 300 candidates received their diplomas of M.D., among them sixteen women, as compared with 2,571 (ten women) in the previous year. For comparison it may be stated that the number of candidates graduating as doctors of the law was 457 in 1911-1912, while this year it was only 381. Of the medical students, 3,780 were German speaking and 2,000 belonged to other (mostly Slavic) nationalities. The religious relations are also interesting. While the Jews form only a small proportion of the entire population of this country (about 4 per cent.), they claim no less than 25 per cent. of the total number of students, especially in medicine and jurisprudence. This indicates that their desire for higher intellectual development is at least six times as great as that of the bulk of the population. It explains also why in various parts of the country the so-called "intellectual proletarians" are so evident. Hitherto, all the warnings against the overcrowding in this profession have been fruitless, and the constant influx of students to the medical career tends to produce really a crisis. The only reason that it has not yet arrived is found in the fact that in the last few years the financial footing of those young men who take up our art for their study seems to be better than in previous years. Medicine is no longer the goal of the penniless youth who thought he could make a living at the very outset of his work.

The Leading Points in the New "Epidemic Act"

A few months ago the new bill called an "Act for Prevention and Fighting of Communicable Diseases" passed both houses of our legislature and therefore is now a promulgated law. All medical men in the empire have now received instructions regarding this law in the shape of a leaflet which contained the following interesting items: "Notice of disease must be made in case of scarlet fever, diphtheria, abdominal typhus, dysentery, epidemic meningitis, puerperal sepsis, exanthematic typhus, small-pox, cholera, plague, relapsing fever, lepra, trachoma, yellow fever, anthrax, malleus and rabies, including injuries by animals suspected of being infected by rabies." (It is interesting that measles, chicken-pox and whooping-cough are not in the list. The reason given for it, that the danger of contagiousness is slight in such cases and that prevention is hardly possible, is not shared by a good many practitioners.) "Each case of disease mentioned before and each death from such as well as every case suspected of belonging to one of these diseases as well as every suspicious death must be notified to the head of the local administrative body. Only puerperal sepsis need not be notified before a definite diagnosis is arrived at. The notification must be made by the medical attendant or the head of the respective hospital or the midwife, the nurse, the head of a school, the innkeeper and, in case of anthrax, malleus and rabies, also the veterinary surgeons, if they learn from their occupation that a person has fallen ill or is suspected of being infected, suspicious objects and localities or those proved of being infectious must be disinfected, and can be destroyed if the disinfection is more expensive than their present value. The local board of health must be notified when the disinfection is completed. Damages sustained by the owners of such disinfected or destroyed objects will be paid for by the state. If persons are kept away from earning their living by being detained or quarantined, they will obtain compensation from the state. Only such persons are entitled to this compensation who are not bound to pay an income tax. The violation of the new law will be punished either

by a fine of $20 (100 kronen) or from one to eight days prison. Officers of the board of public health are entitled to examine the patient or the dead body in order to ascertain the disease or the cause of death. The medical attendant must be consulted by them also. If there is a suspicion that an infectious case is kept secret, the help of the police may be obtained by the board of health." It was not possible to obtain from parliament payment of fees for such notifications for the practitioners; but the government will pay $10,000 (50,000 kronen) a year to the medical societies for orphans and widows of practitioners in recognition of the services rendered by the profession to the state.

Organization of Deaf-Mutes in Austria

Last week the tenth meeting of the Austria Union of Deaf-Mutes took place here and some important decisions have been arrived at. An association comprising all deaf-mutes of this empire was founded and the following resolutions will be brought into force by it: first of all, a sufficient number of schools for deaf-mute children shall be erected, so that all such children who are capable of learning will find opportunities for mental development. At present, no more than from about 30 to 40 per cent. of such defective individuals can be cared for in our schools. It was decided that the time of teaching should be extended to eight years instead of the present four to six years, and that the instruction should approach in its aims very near the mark required for normal children. Defectives who are not fit for schools shall be looked after in special institutions, and homes for old or invalidated deaf-mutes who have no one to care for them will also be established. Two important and interesting points of the transactions were the adoption of a uniform "finger-language" (French method) for Austria, and the compilation of a "register" comprising all deaf-mutes in this country. The uniform "language" is most necessary in our empire since there are no less than eight different nations united for mutual help; for this purpose, cooperation with the teachers of the existing deaf-mute schools will have to be effected, for in Austria the German or "oral" method of teaching is prevalent. The necessity of a register is evident for statistical and biologic reasons, and will be also of a high scientific value.

Marriages

W. H. HOMBACH, M.D., Omaha, Neb., to Miss Margaret Lenora Pierce of Council Bluffs, Ia., in Colorado Springs, August 7.

RALPH C. TILLEY, M.D., Petersburg, Ky., to Mrs. Mattie Bradley Sparks Licker of Aurora, Ind., at Cincinnati, August 22.

BYRON PORTER WALKER, M.D., West Monterey, Pa., to Miss Dorcas Neal Johnston of Pittsburgh, Pa., August 26.

PAUL CARLETON COLEGROVE, M.D., Iowa City, Iowa, to Miss Mildred A. Kerlin of Storm Lake, Iowa, June 11.

JAMES HARVEY BLACK, M.D., Dallas, Tex., to Miss Alleen Marie Patton of Catlettsburg, Ky., September 4.

LEO PAUL VAN RIE, M.D., Mishawaka, Ind., to Miss Lillian Oschulsky of Chicago, at Mishawaka, August 19.

CHARLES SCHRAM, M.D., New York City, to Miss Anna Levi of Cincinnati, at Zurich, Switzerland, recently.

EVERETT WOODS MAECHTLE, M.D., West Allis, Wis., to Miss Velma Vinal of Appleton, Wis., August 20.

EDMUND SIMPSON BOICE, M.D., Richmond, Va., to Miss Lyall E. Caughy of Baltimore, August 20.

REV. SAMUEL LICHNER, M.D., Chicago, to Mathilda Osborne, M.D., of Philadelphia, August 20.

FRANK P. GAUNT, M.D., Nanking, China, to Miss Eugenia Moore of Macon, Mo., August 19.

FRANCIS ROMAN WISE, M.D., to Miss Rupp, both of York, Pa., in Harrisburg, August 18.

J. S. BARDIN, M.D., to Miss Worthie Bell Putman, both of Fort Worth, Tex., August 6.

GEORGE BUOL, M.D., Ravenna, Neb., to Miss Urilla Rudy of Lincoln, Neb., August 8.

JOHN LICK GROH, M.D., Faxman, Pa., to Miss Blanche Myers of Everett, Pa., recently.

E. R. ARN, M.D., to Miss Minna Marie Wannagat, both of Dayton, Ohio, August 27.

Deaths

Eugene Fauntleroy Cordell, M.D. for many years Maryland correspondent of THE JOURNAL, died in Baltimore, August 27, a week after an operation for abscess of the rectum; aged 70. He was born in Charlestown, W. Va., received his preliminary education in the Charlestown Academy and the Episcopal High School of Virginia. He then entered the University of Maryland, Baltimore, and was graduated from its school of medicine in 1868. For many years he was a member of the faculty of his alma mater as professor and honorary professor of history of medicine. He was also librarian of the School of Medicine of the University, and editor of "Old Maryland." His society membership included the American Medical Association; the Medical and Chirurgical Faculty of Maryland, of which he was president in 1904; the Literary and Historical Society of the University of Maryland, of which he was once president; the General Alumni Association of the University of Maryland, of which he was secretary for many years; the Johns Hopkins Hospital Historical Club, the Association of American Medical Librarians and other scientific societies. From 1896 to 1904 he was also professor of the principles of the practice of medicine in the Women's Medical College, Baltimore. In the death of Dr. Cordell the United States has lost one of its foremost medical historians, Maryland, a savant devoted to historical research, and THE JOURNAL of the American Medical Association a most faithful and competent correspondent.

Duff W. Greene, M.D. Medical College of Ohio, Cincinnati, 1876; of Dayton, Ohio; a fellow of the American Medical Association; a specialist on diseases of the eye; a member of the Medical Staff of the National Military Home, Dayton, for 29 years, and for 27 years chief of the ophthalmologic staff of St. Elizabeth's Hospital, Dayton; died suddenly in his automobile, August 16, from heart disease, aged 62.

John Crannell Minor, M.D. College of Physicians and Surgeons, New York City, 1865; a member of the French Medical and Surgical Society and a fellow of the Royal College of Physicians and Surgeons, who served throughout the Civil War as medical cadet, assistant surgeon and surgeon; died at the home of his nephew at Waterford, Conn., August 16, from cerebral hemorrhage, aged 69.

Frederick Llewellyn Bartlett, M.D. Homeopathic Medical College of Missouri, St. Louis, 1868; for 61 years a resident of Aurora, Ill., and once mayor of that city; for ten years a member of the board of directors of the Public Library and for three years its president, and for eighteen years president of the board of education of West Aurora; died at his home August 7, from uremia, aged 69.

Edwin Motley Fuller, M.D. Medical School of Maine, Brunswick, 1873; a fellow of the American Medical Association, and once president of the Maine Medical Association; for twenty years a member of the Medical Corps of the National Guard of the state and prominent in civil affairs; died at his home in Bath, August 8, from septicemia, aged 63.

Emily H. Wells, M.D. Women's Medical College of the New York Infirmary for Women and Children, New York City, 1873; a member of the Medical Society of the State of New York, and at one time president of the Broome County Medical Association; died at her home in Binghamton, August 20, from heart disease, aged 72.

Christian Van der Veen, M.D. University of Michigan, Ann Arbor, 1898; of Grand Rapids, Mich.; a member of the Michigan State Medical Society; once president of the Grand Rapids Academy of Medicine; secretary of the staff of the Butterworth Hospital; died in the Inez Mosher Hospital, August 10, from erysipelas, aged 40.

William Albert Davis, M.D. University of Pennsylvania, Philadelphia, 1876; a fellow of the American Medical Association; physician-in-chief to the Cooper Hospital at Camden, N. J., and consulting physician and director of the Camden City Dispensary; died suddenly at his home, August 17, from heart disease, aged 63.

Cleveland Ferris, M.D. Yale University, New Haven, 1903; a fellow of the American Medical Association and the New York Academy of Medicine; assistant genito-urinary surgeon to the New York Polyclinic and outpatient department of St. Luke's Hospital, died at his home at New York City, August 21, aged 36.

Robert P. Hunter, M.D. Jefferson Medical College, 1869; a member of the Medical Society of the State of Pennsylvania; a veteran of the Civil War; a member of the Pennsylvania legislature in 1911 and 1912, and a school director of Leechburg, Pa., was found dead in his bed in that place, August 13, aged 77.

H. Clay Hart, M.D. Philadelphia University of Medicine and Surgery, 1869; a veteran of the Civil War; at one time a member of the city council of Spencerville, Ohio, and a member of the school board; died at his home near Southworth, Ohio, August 11, from carcinoma of the face, aged 72.

Augustus Maverick, M.D. University of Pennsylvania, Philadelphia, 1907; a fellow of the American Medical Association; a prominent young practitioner of San Antonio, Texas; was shot and killed at his home, August 18, while endeavoring to protect one of his servants from assault, aged 28.

William B. Hostetler, M.D. Albany (N. Y.) Medical College, 1865; a member of the Illinois State Medical Society; for many years local surgeon of the Wabash system in Decatur, where he had practiced for forty-six years; died at his home, August 21, from heart disease, aged 70.

Hubbard Winslow Mitchell, M.D. College of Physicians and Surgeons, New York City, 1886; a surgeon in the navy during the Civil War; a member of the staff of Bellevue Hospital and consulting physician to Roosevelt Hospital, New York City; died at his home, August 12, aged 70.

Emma Therun Pettingill Allen, M.D. New York Medical College and Hospital for Women, New York City, 1892; a member of the visiting staff of the Brooklyn Memorial Hospital for Women; died at her home in Brooklyn, August 9, from malignant disease, aged 68.

John William Fielder, M.D. Medical College of Alabama, Mobile, 1905; of Benton, Ala.; a member of the Medical Association of the State of Alabama; died in a sanatorium in Selma, Ala., August 14, from the effects of strychnin self-administered, aged 30.

William C. Gayley, M.D. University of Pennsylvania, Philadelphia, 1881; a fellow of the American Medical Association, and a member of the Board of Trustees of the Hazleton (Pa.) State Hospital; died suddenly at his home in Hazleton, August 16, aged 54.

John G. Huck, M.D. College of Physicians and Surgeons, Baltimore, 1882; a fellow of the American Medical Association, and a well-known practitioner of Northwest Baltimore; died in Johns Hopkins Hospital, August 13, from heart disease, aged 63.

Allan Blair Bonar, M.D. College of Physicians and Surgeons, New York City, 1890; of Memphis, Tenn.,; while on a visit to his mother at Detroit, died in Grace Hospital, August 14, from disease of the liver due to malaria, aged 50.

Matthew Moore Butler, M.D. Jefferson Medical College, 1860; assistant surgeon and surgeon of the Thirty-Seventh Virginia Infantry, C. S. A., during the Civil War; died at his home in Bristol, Tenn., August 12, aged 75.

Peter Herman Muus, M.D. Minneapolis College of Physicians and Surgeons, 1901; in 1905 mayor of Kensington, Minn., and later a practitioner of Albert Lea; died at his home August 12, aged 39.

Charles M. H. Schwartz, M.D. University of Iowa, Iowa City, 1880; formerly of Lyons, Iowa; died at the home of his daughter at Mooseman, Canada, August 10, from cerebral hemorrhage, aged 64.

Abraham P. Frick, M.D. University of Pennsylvania, Philadelphia, 1861; local surgeon at Aransas Pass, Texas, for the San Antonio and Aransas Pass Railroad; died at his home, July 11.

George Dutton Ladd, M.D. Rush Medical College, 1875; a member of the Wisconsin State Medical Society, and president in 1896; died at his home in Milwaukee, August 15, aged 63.

Jeromus Rapelye (license, New York), a practitioner since 1864; a veteran of the Civil War; died at his home at Maspeth, N. Y., August 12, from senile gangrene, aged 78.

Theodore Wigand, M.D. University of Marburg, Germany, 1873; a practitioner of California since 1877; was killed in San Francisco August 12, in an automobile accident.

William J. Clontz, M.D. Vanderbilt University, Nashville, Tenn., 1887; of Alexander, N. C.; was shot and almost instantly killed in that place August 11, aged 58.

Giles Harris, M.D. Kentucky School of Medicine, Louisville, 1880; died at his home in Richmond, Ky., August 10, aged 68.

Frank Walton, M.D. Vanderbilt University, Nashville, Tenn., 1899; a fellow of the American Medical Association; was shot and killed at Mulga, Ala., August 18, aged 38.

Joseph F. Blount (license, Indiana, 1897), for many years a practitioner of Evansville, Ind.; died at his home in that city, August 16, from senile debility, aged 86.

Edward G. Forshee, M.D. Cincinnati College of Medicine and Surgery, 1864; died in his home at Kinmundy, Ill., July 10, from acute gastritis, aged 78.

Charles Wilbor Ray, M.D. Bennett Medical College, Chicago, 1885; formerly of Nicollet, Minn.; died at his home in Los Angeles, August 12, aged 57.

Lewis J. Burch, M.D. Atlanta College of Physicians and Surgeons, 1904; of Waycross, Ga.; died in a sanatorium in Atlanta, August 2.

Thomas Wilson Monroe (license, Massachusetts, years of practice), died at his home in Milford, July 10; aged 68.

William Ely Jones, M.D. Miami Medical College, Cincinnati, 1890; died at his home in Cincinnati, August 11, aged 44.

Correspondence

Tuberculosis Acquired through Ritual Circumcision

To the Editor:—My attention has been drawn to an article with this title in THE JOURNAL, July 12, 1913, p. 99, by Dr. E. Emmett Holt. He concludes his article thus: "While the number of reported instances of tuberculosis acquired through circumcision is considerable, there must be a very much larger number that have never found their way into literature. It is certain also that syphilis has been spread in this manner. These facts lead me to emphasize the statement made by the late Professor Maas, the German surgeon, that 'it is the duty of the physician to raise his protest against the performance of ritualistic circumcision in every case.'"

I assume that Dr. Holt does not thus protest against all circumcision, for every physician recognizes its desirability and its necessity in his practice. And I assume that he does not protest against its being regarded by us as a religious duty, for a religion which inculcates physical as well as spiritual health must command the respect and admiration of all men. I assume therefore, that Dr. Holt objects merely to certain details of the operation as performed by some practitioners. In this he is correct.

The operation itself, as practiced, consists of three details:

1. The "Milah" or excision. For this modern surgery demands that the instrument used shall be properly sterilized before the operation.

2. The "Periah" or separation of the inner lining of the prepuce from the glans. For this modern surgery demands that a proper forceps shall be substituted for the fingers or thumb.

3. The "Metsitsa" or suction of the blood from the wound. For this modern surgery demands that a hemostat shall, when necessary, be employed to replace such a method of hemostasis.

The operation antedates by many centuries, indeed, by thousands of years, modern surgical methods. Less than a single century ago, hemostasis by hot oil or hot pitch was countenanced by accepted surgery. It required time to bring about changes to modern methods. Much less time will be required to improve the methods complained of in "ritualistic" circumcision, particularly when we remember not only that many Jewish operators in America use modern methods of asepsis, and that in such countries as England, France, Germany and Scandinavia they may not otherwise practice, but also that the Jewish religious law insists on every precaution in matters of health and demands that when "Sekanah" or "danger" to health is critically involved, any religious custom and any duty not may, but must, be overridden.

We must further remember that all the offending operators are from Russia, Roumania, Hungary, Galicia, etc., where universities and medical schools close their doors to Hebrews

or receive but very few; where cruel prejudices further shackle them; where unjust laws impose further restrictions, and where, for that matter, general medical and surgical practice is in the hands of "felchers" or imperfectly trained barbers.

A few operators may demur at changes, for old customs die hard. But the operators, as a body, are open to reason and will be found obedient to all requirements, especially when told authoritatively by their religious leaders that their present methods have in them elements of "Sekanah" or "danger." I can imagine nothing that would fill them with greater horror or with more genuine sorrow than to know that they endanger life.

Some time ago, as president of the Union of Orthodox Jewish Congregations, I appointed a committee on this very matter, and subsequently I drew the attention of this local branch of the American Jewish Committee to the subject. Dr. Holt's article will spur both committees to further action.

H. PEREIRA MENDES, M.D., New York.
Minister Spanish and Portuguese Congregation.

Need for Inexpensive Obstetric Nurses

To the Editor:—Dr. Milligan's letter on this subject (THE JOURNAL A. M. A., Aug. 23, 1913, p. 617) treats of a matter that is of tremendous importance in St. Louis, as well as in Detroit. He bewails the fact that there is not a supply of clean, sensible, practical nurses whose services may be had by the family of small means. We have nurses of this kind, but they are failures because they belong to one of the two following classes:

Class 1 consists of women who, after helping in twenty or more cases, feel confident of their ability to manage an obstetric case without the guiding hand of a physician. Some of these women are honest. Their chief defect is that they are not aware of the extent of their ignorance. Some are not so honest, produce abortions occasionally, and make a miserable failure of their avocation. This is the class that injures the reputation of all practical nurses. Most women of this class have had no hospital training.

Class 2 consists of clean and willing workers who are aware of the deficiencies of their training and who attempt to make up for this deficiency by blindly and loyally abiding by the instructions of the physicians. A woman of this class is always busy, and as the supply does not equal the demand, she is soon justified in increasing her charges. Most women of this class are no longer very youthful and have had some hospital training. Strictly speaking, these women are not failures, but they are classed as failures here, because they are no longer to be had by the family of small income.

The poor man has a right to expect physicians' services at reduced rates. He cannot, however, make a similar claim against the graduate nurse, because she is already miserably underpaid.

I agree, therefore, that a supply of nurses who have had six months' training in a few essentials would place a poor man's wife in a safer position.

W. C. GAYLER, M.D., St. Louis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

GELATIN MOUNTING AND PRESERVATION OF GROSS SPECIMENS

To the Editor:—Will you kindly publish reference or give brief description of latest and best technic for gelatin mounting and preservation of gross specimens? E. W.

ANSWER.—In the issue of THE JOURNAL for May 17, 1913, p. 1586, is given a method for preserving gross specimens in a sugar solution. The tissue is immersed in the usual formaldehyd solution for from six to twelve hours, then in 50 per cent. alcohol from twelve to twenty-four hours and then it is transferred to an oversaturated solution of beet-sugar. Only enough water is added to dissolve some of the sugar, leaving a little sugar in the bottom of the jar. That is a permanent mount.

In 1902 W. H. Watters of Boston published a method of molding specimens in gelatin. The specimen was fixed for from two to four days in Kaiserling No. 1, then from three to five days in Kaiserling No. 3, and then it was embedded in the following mixture: Kaiserling No. 3, 15 parts; gelatin, 1 part. This mixture is rendered liquid in a hot-water bath. To this is added the white of one egg and the mixture is heated until coagulation of the albumin is complete. The solution is then carefully filtered and allowed to cool. It is now ready for use. Specimens prepared in the usual way for Kaiserling solutions are cut into sections of about 1 cm. thickness in such a manner that one of the flat surfaces shows the features desired. Into a Petri dish is poured a thin layer of the gelatin solution now cooled to from about 30 to 35 C. (from 86 to 95 F.), and in this the section is placed face downward. The gelatin soon solidifies and thus holds firmly and evenly against the glass the particular surface desired to be seen. The entire Petri dish is now filled with gelatin solution till a convexity is formed above the edges. A square glass plate is removed from a basin of water and placed, while still wet and with the rough surface down, over the Petri. If this procedure is performed carefully, touching first one edge of the dish with the plate and then dropping it slowly, a wave of gelatin will be formed which will force out any air bubbles that may be present. The plate is placed in proper position and the entire preparation left to harden, which it will do quite well in from half an hour to two hours, according to its initial temperature and the degree of room heat. After the superfluous gelatin has become solid it is removed by a coarse brush immersed in water. The glass is then dried, a layer of Canada balsam is applied to seal the point of union between the plate, which we now recognize as the base, and the Petri dish, which now forms the top of the mount, and the name of the specimen is written in ink on the ground glass. In a day or two the balsam will be dry and the preparation has been completed.

BLOOD-PRESSURE AND THE EFFECT OF ALTITUDE

To the Editor:—1. What is considered normal blood-pressure in man?

2. What is the effect of altitude on blood-pressure? Does an altitude of 7,000 feet make any difference in blood-pressure?

G. W. LINVILLE, M.D., Woodmen, Colo.

ANSWER.—1. The normal blood-pressure may be stated as an average of 127 for males, all ages, and 120 for females. There are many circumstances which cause a variation from the average. The blood-pressure tends to rise with age, so that a pressure considerably above the average at the age of 60 might not be abnormal.

2. The blood-pressure is diminished with altitude, the difference at 6,000 feet being about 5 mm.; but long residence at high altitude tends to make it return to nearly the normal figures. The fall of systolic pressure is slightly greater and more certain to occur than the fall of diastolic pressure. High altitudes do not affect all persons in the same degree, and small elevations in altitude do not materially influence blood-pressure.

Reference may be made to the work of Charles F. Gardiner, M.D., and Henry W. Hoagland, M.D. (*Tr. Am. Climatol. Assn.*, 1905, xxi, 80); and those of Y. Henderson (*ibid.*, xxviii), and of W. A. Campbell, (*ibid.*, xxviii, 16).

RELATIVE THERAPEUTIC VALUE OF SALVARSAN AND NEOSALVARSAN

To the Editor:—Please answer the following questions with reference to salvarsan and neosalvarsan:

1. Which is the least toxic?
2. Which gives the better results (therapeutically)?
3. Which is the better preparation (*a*) for intramuscular work; (*b*) for intravenous?
4. Being away from a laboratory doing the Wassermann, as a general rule how many doses would be considered sufficient, the patient receiving the first dose during the primary or secondary stages? J. C. M.

ANSWER.—1. There appears to be no essential difference.

2. The two are believed to be practically identical in their therapeutic effects. Some authors, however, who have tried both prefer salvarsan.

3. (*a*) Probably salvarsan. (*b*) Probably neosalvarsan.

4. The physician who undertakes the treatment of a case of syphilis should be prepared either to perform the Wassermann test himself or to have it done at a laboratory. Specimens of blood can easily be sent for such examinations. It is impossible to state positively how many injections are needed. The proper treatment of this disease requires the administration of mercury as well as salvarsan. The physician must be guided in the use of salvarsan by the condition of the patient and the character of the Wassermann reaction as to whether he shall use one or more injections of salvarsan in a series, and the number of series required, as well as the interval between them.

WALNUT JUICE AS A HAIR-DYE

To the Editor:—Please give me the following information: 1. What is a good, harmless dye for making the hair black? 2. Is walnut stain a good, permanent dye? 3. Where can a trustworthy preparation of walnut stain be bought? 4. Is henna better, and what is a trustworthy preparation of this substance?

ANSWER.—1. There is no hair-dye that is exactly satisfactory and none that can be guaranteed harmless under all circumstances. Analyses and published formulas of hair-dyes show that most of them contain one or more of the following substances in addition to solvents or ointment bases: salts of bismuth, copper, iron, lead, silver and vanadium, ammonium sulphid, ammonium carbonate, hydrogen dioxid (in conjunction with tinctorial substances) pyrogallol, paraphenylen diamin (and other anilin dyes), henna and walnut juice. Several of the less objectionable formulas for black hair-dyes were given in THE JOURNAL A. M. A., Oct. 14, 1911, p. 1305.

2. Authoritative information is lacking concerning the permanence of walnut juice as a hair-dye. Walnut juice alone produces a brown stain on the hair, but a darker color may be obtained by using it in conjunction with some nigrescent substance such as resorcinol or pyrogallol. The following formulas were published in the *Druggists' Circular*, August, 1907, p. 545:

	gm. or c.c.	
Green walnut hulls	40	ʒ x
Resorcinol	4	ʒ i
Glycerol	60	℥ ij
Water ..... enough		

Grate the hulls and boil in 500 c.c. or a pint of water for thirty minutes, strain, add the resorcinol, glycerol and enough water to make 400 c.c. or 14 ounces

	gm. or c.c.	
Copper chlorid	150	ʒ v
Distilled water	325	ʒ xi
Stronger ammonia water ...	150	℥ v

Mix and add gradually, with constant stirring to a solution of:

	gm. or c.c.	
Pyrogallol	200	ʒ vii
Hydrochloric acid	675	ʒ xxiiss
Distilled water	1.000	ʒ xxxii

Then add with stirring

	gm. or c.c.	
Stronger ammonia	190	ʒ viss
Solution of hydrogen dioxid	950	ʒ xxxii
Water enough to make ...	4.000	ʒ cxxviii

Store in a wide-mouthed jar exposed to the air for fourteen days, stirring the liquid occasionally.

3. It is probable that most of the commercial preparations which use such expressions as "walnut stain," "walnut tint," etc., as selling points do not contain any walnut juice, but depend for their colorific properties on some of the synthetic dyes, such as paraphenylen diamin. (THE JOURNAL A. M. A., April 3, 1909, p. 1121, and Oct. 16, 1909, p. 1307.)

4. Henna stains the hair yellow.

LAVAGE IN CASES OF HEMORRHAGE

To the Editor:—In THE JOURNAL, July 26, 1913, p. 256, Dr. Billings states: "In hemoptysis due to chronic ulcer of the stomach, hemorrhage may not cease so long as the stomach is distended with blood and other contents. Lavage with normal salt solution, until the stomach is empty, is safe and often effective." I dislike to express a contrary opinion, but it appears to me that a statement like the above is a dangerous one to make for obvious reasons. To my mind, such advice needs some reservation or limitation.

W. F. VON ZELINSKI, Chicago.

ANSWER.—Lavage in cases of hemorrhage of the stomach is recommended by a number of authors and under the conditions indicated by Dr. Billings is fully justified. Our correspondent's opinion emphasizes the necessity of following advice with due consideration of the conditions present, and the proper caution in the manipulations necessary.

DURATION OF IMMUNITY FROM TETANUS AFTER INJECTION OF ANTITETANIC SERUM

To the Editor:—Recently a client brought to my office his son, who had stepped on a rusted nail. I advised a prophylactic injection of antitetanic serum, which was given. After the injection my client asked, "How long will my son now be protected against tetanus?" Please give me your opinion. R. A. C.

ANSWER:—Tetanus antitoxin is eliminated from the system from eight to ten days after injection. It remains in practically undiminished amount for a week and then rapidly diminishes to nothing in the course of a few days. Therefore the immunity conferred is protective for not more than a week.

EPIPHANIN AND NINHYDRIN REACTIONS

To the Editor:—Please give information with regard to the following: (1) epiphanin reaction, (2) ninhydrin reaction.

C. E. MCBRAYER, M.D., Haines, Alaska.

ANSWER.—1. The epiphanin reaction is applied to the detection of antibodies in the blood-serum, especially in the serodiagnosis of syphilis. The technic depends on a change of reaction to phenolphthalein in a neutralized solution. A mixture of the suspected solution and of an extract from a syphilitic organ are made as follows: 0.1 c.c. of a 10 per-cent. solution of the serum in physiologic salt solution is mixed with 0.1 c.c. of an alcoholic extract of a syphilitic fetal liver. To this is slowly added 1 c.c. of decinormal sulphuric acid and 1 c.c. of an exactly equivalent solution of barium hydroxid. On the addition of a drop of phenolphthalein solution, the fluid turns red if the serum is from a syphilitic, while there is no change in tint with the serum of a non-syphilitic person. See also Abstract 74, THE JOURNAL, Jan. 21, 1911, p. 228.

2. Ninhydrin is a proprietary name for triketohydrindene hydrate, used as a reagent for proteins and amino-acids. The reagent gives a blue color with all compounds which have an amino group in the alpha position to the carboxyl. It is used for the detection of peptone or amino-acid in a test for pregnancy as follows: About 1 gm. of coagulated placental tissue, which on boiling with water yields no compounds which react with ninhydrin, is placed in a diffusion cell and covered with from 2 to 3 c.c. blood-serum and the mixture dialyzed in 20 c.c. distilled water. The contents of the cell and the outer fluid are covered with a layer of toluol. Dialysis is continued from twelve to sixteen hours at a temperature of 37 C. in the incubator. To 10 c.c. of the dialysate 2 c.c. of a 1 per cent aqueous solution of ninhydrin are added. The mixture is heated and kept at the boiling point for just one minute. If the serum is derived from a pregnant woman, a blue coloration of the dialysate occurs. This coloration is absent if the serum is from a person who is not pregnant.

ABDERHALDEN'S SERUM DIAGNOSIS OF PREGNANCY

To the Editor:—Please give me the address of Dr. Abderhalden, the originator of the biologic test in the diagnosis of pregnancy, and directions for the preparation and administration of the test.

C. D. BOUVIER, Berkeley, Cal.

ANSWER.—Professor Emil Abderhalden, Professor of Physiology, Halle University, Halle, Germany.

Abderhalden's test for pregnancy is based on the observation that when foreign substances are introduced into the blood a specific ferment is elaborated which is capable of decomposing these materials; thus in pregnancy cells from the placenta enter the blood and excite the formation of ferments capable of digesting the placental cells. The products of this decomposition of placental cells are diffusible protein derivatives, either peptones or amino-acids. If, therefore, a piece of placental tissue is acted on by the serum of a pregnant woman, the cells of the placenta will be decomposed, and soluble and diffusible products will be formed. When such a mixture is placed in a diffusion cell the products of the digestion diffuse into the water surrounding the cell and may be detected in the dialysate. If the serum is from a non-pregnant woman, no specific ferments are present, and hence no digestion takes place and no products diffuse into the dialysate. Abderhalden employs the ninhydrin reaction for testing the presence of these protein derivatives in the dialysate. It is evidently necessary before applying this test to make sure that the material tested contains nothing which can diffuse through the membrane so as to give the reaction. Abderhalden states that it is not enough to test the placental tissue and the serum by themselves, but that a test of the two combined must be made.

The biologic test for pregnancy, according to Abderhalden, is carried out as follows: About 1 gm. of coagulated placental

tissue is boiled with ten times its volume of water, the water poured off and this treatment repeated until the liquid contains nothing which will give a reaction with ninhydrin. When it no longer responds to the ninhydrin test it is placed in a diffusion cell with from 2 to 3 c.c. of blood-serum, and the mixture is allowed to diffuse into 20 c.c. of distilled water. Both the dialysate and the liquid in the cell are covered with a layer of toluol. The dialysis is continued for from twelve to sixteen hours in the incubator at a temperature of 37 C. (98.6 F.).

To 10 c.c. of the dialysate 0.2 c.c. of a 1 per cent. aqueous ninhydrin solution is added, and the test performed as follows: The mixture is placed in a test-tube and boiled for exactly one minute. If protein derivatives are present, the mixture will turn blue and it may be assumed that the serum comes from a pregnant woman. If no color appears, it is to be assumed that the serum is from a non-pregnant woman.

Abderhalden also tests for pregnancy by mixing the serum with a solution of peptone derived from the placenta. If the peptone is decomposed, a change in the optical rotatory power will occur which can be detected by examining the mixture in a special polarimeter devised by Abderhalden. This method is more expensive than the dialysis method, but is said to be more accurate.

The following is a list of references on Abderhalden's serum diagnosis of pregnancy:

Judd, Charles C. W.: The Serum Diagnosis of Pregnancy, THE JOURNAL, June 21, 1913, p. 1947.
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Heimann, F.: Serodiagnosis of Pregnancy, *München. med. Wchnschr.*, April 29, 1913; abstr., THE JOURNAL, June 7, 1913, p. 1841.
Bohne: Biologic Test for Pregnancy, *Zentralbl. f. Gynäk.*, April 26, 1913; abstr., THE JOURNAL, May 31, 1913, p. 1754.
Abderhalden, E., and Freund, R.: Serodiagnosis of Pregnancy and Cancer, *München. med. Wchnschr.*, April 1, 1913; abstr., THE JOURNAL, May 17, 1913, p. 1568.
Schlimper, H., and Hendry, J.: Serodiagnosis of Pregnancy, *München. med. Wchnschr.*, April 1, 1913; abstr., THE JOURNAL, May 17, 1913, p. 1586.
Williams, P. F., and Pearce, R. M.: Abderhalden's Biologic Test for Pregnancy, *Surg., Gynec. and Obst.*, April, 1913; abstr., THE JOURNAL, May 3, 1913, p. 1396.
Petri, T.: Serodiagnosis of Pregnancy, *Zentralbl. f. Gynäk.*, Feb. 15, 1913; abstr., THE JOURNAL, March 22, 1913, p. 951.
Lindig, P.: Serodiagnosis of Pregnancy and Tumors in Genital Organs, *München. med. Wchnschr.*, Feb. 11, 1913; abstr., THE JOURNAL, March 23, 1913, p. 950.
Veit, J.: Serodiagnosis of Pregnancy, *Ztschr. f. Geburtsh. u. Gynäk.*, Dec. 21, 1912; abstr., THE JOURNAL, Feb. 15, 1913, p. 562.
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Ekler, R.: Reliability of Serodiagnosis of Pregnancy, *Wien. klin. Wchnschr.*, May 1, 1913.
Henkel, M.: Serodiagnosis of Pregnancy, *Arch. f. Gynäk.*, Feb. 8, 1913.
Schwarz, Henry: The Serodiagnosis of Pregnancy, THE JOURNAL, Aug. 16, 1913, p. 484; The Practical Application of Abderhalden's Biologic Test of Pregnancy, *Interstate Med. Jour.*, May, 1913, p. 393; Abderhalden's Serodiagnosis of Pregnancy and Its Practical Application, *Interstate Med. Jour.*, March, 1913, p. 195.

THE AMERICAN HOSPITAL OF PARIS

To the Editor:—Please give a brief outline of the (1) history, (2) location, (3) resident staff, (4) facilities, (5) departments, (6) maintenance, etc., of the American Hospital of Paris.

M. Q.

ANSWER.—Write to the American Hospital of Paris, 55 Boulevard du Château, Neuilly-sur-Seine, Paris, France.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POST-GRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

NEWSPAPER COMMENTS ON PUBLIC HEALTH TOPICS

Newspaper comments on public health topics are increasing both in frequency and in seriousness of consideration. A few years ago an editorial on a health topic in a daily newspaper was a curiosity, and the views of the majority of newspaper editors on this subject were too often hazy or flippant. To-day, the leading newspapers of the country recognize that the conservation of the public health is one of the most serious subjects which can be discussed in their columns. The change in public sentiment during the last six years, as reflected by the editorial columns of the leading newspapers, is most striking. Even the more radical proposals of those interested in eugenics have not failed to secure commendation from many of the big newspapers, at least so far as the spirit of the proposed regulation is concerned.

State Regulation of Marriage

The Memphis (Tenn.) *Commercial Appeal*, commenting on the passage of the radical law for the restriction of marriage in Wisconsin, says:

"Wisconsin has blazed the way . . . Realizing the advantage of a strict marriage law, by an overwhelming majority in both branches, the legislature has passed one which will become effective on August 1. It is undoubtedly a radical move, but it is a move which will certainly be followed by other states in a very short time. The eugenic problem has been closely studied. It has grown in importance . . . The two measures enacted by the Wisconsin legislature are drastic enough to satisfy the most extreme advocate of the new cause. Both measures apply to marriage and the future of the race . . . Common sense shows the great advantage of both of these laws. Too many people, unfitted for marriage, rush into the responsibility of such an estate without realizing what the future will be. Men and women afflicted in a way which should prohibit their marriage do not profit by this knowledge and suffer afterward."

The Chicago *Record-Herald* is in sympathy with the movement, but sounds a warning, the keynote of which is a quotation from a British physician to the effect that the United States has "possibly gone too far" in eugenics legislation. Regarding the discussion in the different state legislatures, the *Record-Herald* looks on some of it as experimental, some as sensible and simple and some as perhaps unduly in advance of true scientific knowledge:

"The marriage certificate is an excellent safeguard within reason. To demand perfect health, instead of freedom from certain diseases, is to encourage immorality and to make our last state worse than the first. The business of students of eugenics is quite as much to tell legislators what not to attempt at this stage as it is to tell them what restrictions social health and social purity render it imperative or at least proper to impose."

The State's Duty in Public Health

The Cincinnati *Enquirer* discusses the relation of the state to health in a broad way, saying:

"It is coming to be taken for granted that as the state is charged with the duty not only of punishing crime, but also of preventing it, so it is also its duty not only to care for all sufferers from disease who are unable to care for themselves, but to use every possible means which modern scientific knowledge has made available to prevent disease."

After discussing governmental quarantine regulations, old-age pensions and industrial insurance in the light of this general belief, the *Enquirer* sees no reason why the state is not justified in securing better hygienic and social conditions in regulating or at least restricting the production of future generations, it says:

"Both lawyers and doctors have been studying the question of the sterilization of idiots, feeble-minded persons, and some classes of criminals, with a view to eliminating them eventually from the social fabric. The doctors, as a whole, have not acted in the matter, although their journals seem favorable to such a law. The lawyers have had a committee report on the subject, which makes no recommendation . . . If the state is justified in entering every man's domicile and insisting that he send his children to school, surely it is of equal or even greater concern to the good of all, both now and for generations to come, that it sees to it that good health is

cultivated and disseminated, and the ravages of disease suppressed."

It is a question whether or not the analogy between compulsory education and compulsory sterilization is a sound one. With our present knowledge, it is impossible to say that criminality is hereditary. We do know positively, however, that feeble-mindedness is. A normal woman may have feeble-minded offspring, but a feeble-minded woman seldom, if ever, gives birth to a normal child. The strongest argument in favor of sterilization is the protection it affords to those persons who are not capable of protecting themselves.

The Chicago *Journal* discusses the American tendency to want a law on every possible subject. It says:

"When a new idea comes into the world, the first act of many persons is to throw a brick at it; the next is to enact it into law . . . An example is found in the wild enthusiasm of some people for what they are pleased to call 'eugenic laws.' Few of these enthusiasts know anything of eugenics, but they all want a law on the subject. They want laws prohibiting the marriage of men who get drunk, laws for the permanent segregation of all persons with a taint of insanity in their blood, and in one state they have secured a statute providing for the sterilization of epileptics."

The *Journal* then discusses the celebrated epileptics of history, referring especially to Napoleon and Mohammed. It does not clinch its argument, however, by showing that the world is any better off for either one of the characters, provided either of these were epileptics. The *Journal's* conclusion, however, is too good to make it worth while to quarrel over its historic deductions:

"The time is not ripe for much legislation designed to improve the human race. People do not know enough about that subject as yet to pass intelligent laws on it. Imbeciles who cannot care for themselves should be cared for under circumstances which will keep them from having imbecile children. A law providing for such care would be justifiable and useful and the same law should be applied to congenital criminals. [Quite true, but how is one to determine who are, or who will be, the congenital criminals?] A law requiring health certificates as a preliminary to marriage rests on a much more doubtful basis, but it might do some good. Further than this, in the present condition of knowledge the state has no right to go."

However one may differ from the reasoning of the *Journal*, there can be nothing but agreement with its final conclusion: "Real race improvement depends on education rather than on laws."

Boston Journal Plans Special Articles on Sanitation

The Boston *Journal* announces that it has inaugurated a series of special weekly articles dealing with modern medicine and hygiene, the plan being the culmination of a feeling among a group of eminent Boston physicians that the progress of preventive medicine is hampered on account of the lack of public understanding of the aims of modern scientific medicine. The statement of the *Journal* on this point can hardly be improved on:

"In the endeavor to raise the standard of general health, it is essential that the public learn to cooperate understandingly through the dissemination of non-technical medical information in the public press . . . The fundamentals of preventive medicine should be understood by the public at large, and that can only be done through the newspapers . . . We need scarcely add that we consider this a movement of profound importance."

It is of profound importance, even more than any one in the present generation realizes.

Vital Statistics in Georgia

The legislature is in session in Georgia. The model vital statistics bill has been introduced and the prospects for its passage are bright. The leading newspapers of the state are a unit in asking for its adoption. The Atlanta *Journal*, after discussing the measure and the fact that Georgia is to-day without any standing in the federal health reports on account of its lack of proper registration, says:

"The result is inevitably damaging to the state's reputation and to its material progress, for among the first questions asked by a prospective home-seeker or investor is the question of health and sanitation. No man wants to live in a community whose health conditions are doubtful or unknown and few men will risk an investment there. How then can Georgia expect to get her due share of the thrifty settlers and the millions of capital that are trending southward when she has no official standing in the government health records to which people everywhere turn for guidance and for information? Georgians know that they have a naturally healthful state, but the important thing is that the world shall know this."

A Portland View of Doctors

The change in attitude toward modern medicine has brought about a different attitude toward the modern physician. The Portland (Ore.) *Journal*, under the title, "The Doctors" comments on an attack made on the medical profession by some local writer:

"It is fashionable to do that. There are those who would hang all the doctors, and burn all the drugs . . . Perhaps the profession has shortcomings. Perhaps the knife is sometimes used when no operation is necessary . . . But what are all these complaints to the man who was crippled and is now sound? . . . What weight have these criticisms with the literal army of men and women daily rescued by surgical and medical skill from pain and death, and restored to home, health and happiness? To all the salvaged human host, surgery is Godlike, and your real surgeon a messenger of mercy."

St. Louis Campaign Against Infantile Paralysis

Following a demonstration of the dissemination of infantile paralysis by flies and its connection with disease in poultry, the St. Louis *Globe-Democrat* comments on the efforts of St. Louis physicians to raise a sufficient sum to carry on further investigation. The *Globe-Democrat* characterizes these professional efforts as "a fine example of the high spirit and philanthropic impulse of the medical profession," and says:

"We hear of a medical trust and of charges that doctors of one school or another, or several, are combined to prevent independent investigation and any work that will eliminate disease and deprive them of fees . . . The fight against tuberculosis is chiefly led by doctors. No one disease supplies more physicians' fees than consumption, yet it is the doctors who are working the hardest to destroy it. No class of persons, including all others combined, do so much to educate the people in preventive measures to ward off disease . . . No occupation shows a higher percentage of men working unselfishly for the good of their fellows than the medical profession."

Medical Education and State Boards of Registration

Connecticut Homeopathic July Report

Dr. E. C. M. Hall, secretary of the Connecticut Homeopathic Medical Examining Board, reports the written examination, held at New Haven, July 8-9, 1913. The number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 2, all of whom passed. One candidate was licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Hahnemann Medical College and Hosp., Chicago.	(1913)	81
New York Homeopathic Medical College.....	(1913)	83

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
New York Homeopathic Medical College.....	(1907)	New York

New Hampshire July Report

Mr. H. C. Morrison, regent of the New Hampshire State Board of Medical Examiners, reports the written examination,

examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 20, of whom 16 passed and 3 failed. For one candidate the application was not complete. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Medical School of Maine	(1879) 75; (1909) 83; (1913)	87, 89
Baltimore Medical College	(1907) 75; (1909)	75
Maryland Medical College	(1912)	80
Boston University	(1904) 90, 91; (1913)	88
Harvard Medical School	(1909)	76.5
Dartmouth Medical School	(1912) 85; (1913)	80, 82
University of Buffalo	(1907)	89
University of Vermont	(1911)	80
FAILED		
Maryland Medical College	(1912)	64
Dartmouth Medical School	(1910)	71
University of Vermont	(1913)	70

New Jersey June Report

Dr. H. G. Norton, secretary of the New Jersey State Board of Medical Examiners, reports the written examination held at Trenton, June 17-18, 1913. The number of subjects examined in was 9; total number of questions asked, 90; percentage required to pass, 75. The total number of candidates examined was 43, of whom 38 passed, including 1 osteopath, and 4 failed. For one candidate application is not completed. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Howard University, Washington	(1912); 81.2 (1913)	78.3
University of Louisville	(1911)	79.2
Tulane University of Louisiana	(1900)	81.6
College of Physicians and Surgeons, Baltimore	(1913)	84.1
Harvard University	(1912)	75.5
Eclectic Medical College of the City of New York	(1912)	75.8
Long Island College Hospital	(1913)	78.3
New York Homeopathic Medical College (1913) 76.3, 81.4, 82.4.		
University and Bellevue Hospital Medical College (1911) 84; (1912) 82.1; (1913) 76.6, 86.4.		
Cornell University Medical College	(1911)	80.9
Fordham University	(1912)	82.5
University of Pennsylvania (1910) 84.5; (1911) 80.1; (1912) 83.1; (1913) 78.5, 81.8, 86.5, 87.5.		
Jefferson Medical College (1886) 76; (1912) 78.6, 79.5; (1913) 75.6.		
Hahnemann Medical College and Hospital, Philadelphia (1908) 76.1; (1913) 80.7, 82.9.		
Medico-Chirurgical College of Philadelphia	(1913)	78.5
Women's Medical College of Pennsylvania	(1913)	75.5
University of Tennessee	(1911)	86.6
Medical College of Virginia	(1913)	80.6
University College of Medicine, Richmond	(1909)	83
University of Naples, Italy	(1908)	75.6
FAILED		
College of Physicians and Surgeons, Baltimore	(1911)	73.1
University of Maryland	(1910)	72.7
Hahnemann Medical College and Hospital, Philadelphia (1912) 72.5.		
University of Naples, Italy	(1893)	57.6

The following questions were asked:

ANATOMY

1. What parts enter into the formation of the shoulder-joint? 2. Give four principal points of distribution of the pneumogastric nerve. 3. What area is drained by the ductus lymphaticus dexter? 4. Describe the cerebrospinal fluid and state where it is normally found. 5. Trace on the chest the outlines of the lung during inspiration and expiration; give the gross anatomy of the lung and describe lung tissue. 6. Give location and structure of the thymus gland and state the changes likely to occur in it. 7. Indicate by drawing or otherwise the relation of the uterus to the ovary, the fallopian tubes, the round ligament and the bladder. 8. Give the origin, course, relations and branches of one of the following arteries: brachial artery, femoral artery, middle meningeal artery. 9. Name (*a*) the nerves of special sense; (*b*) the nerves of motion of the brain. 10. Give the distribution of the radial nerve below the wrist.

PHYSIOLOGY

1. In the process of metabolism, how are the following utilized: (*a*) proteids? (*b*) carbohydrates? (*c*) fats? (*d*) salts? 2. State the influence on respiration of: (*a*) the vagus nerve; (*b*) the superior laryngeal nerve. 3. Explain the difference in the action of saliva on raw and cooked starch. 4. Describe the digestion of a meal consisting of oatmeal, bacon, buttered toast and coffee. 5. What is glycogen? What is its use in the body? 6. Describe briefly the circulation of the blood. 7. What is the relation of the pneumogastric nerve to the stomach? What function of the stomach is controlled by the splanchnic nerves? 8. What nerve is affected when the following symptoms are present: external strabismus, ptosis and mydriasis? 9. Mention the enzymes of pancreatic juice and state the functions of each. 10. From what portions of the cortex cerebri do the arm, the face and the leg receive their motor impulse?

HISTOLOGY

1. What do you mean by staining, and what is the object of staining? 2. What is section staining? Mention six suitable stains. 3. What is bulk staining? Mention three suitable stains. 4. Describe two methods of impregnation.

PATHOLOGY

1. Describe the appearance of the pia mater in tuberculous meningitis. 2. Describe the changes in periostitis. 3. Give causes, varieties and results of abnormal blood-pressure. 4. What is venous stasis? Give causes and results.

BACTERIOLOGY

1. Describe autogenous stock and polyvalent vaccine. 2. What are antigens?

CHEMISTRY

1. Give the composition and properties of urea. 2. What is the normal composition of urinary calculi? Give tests for recognizing principal ingredients. 3. Give the character of (*a*) diabetic urea; (*b*) nephritic urea; (*c*) cystitic urea. 4. Define fermentation, putrefaction, decay. 5. What is chemistry? 6. Explain the atomic theory. 7. What is the chemical composition of bone? 8. What are the properties of bile? Give the chief constituents. 9. Give Marsh's test. 10. What is the difference between vegetable and animal life from a chemical standpoint?

OBSTETRICS

1. Define position and presentation, and name two varieties of each. 2. Give indications for use of forceps; for internal podalic version; and for cesarean section. 3. Give cause, symptoms and time of occurrence of puerperal infection, and means of preventing it. 4. Give two indications for the induction of premature labor, and describe one method of performing it.

GYNECOLOGY

1. Differentiate ovaritis, right-sided renal colic and appendicitis. 2. Give causes, symptoms and findings on examinations of salpingitis. 3. Describe three varieties of uterine fibroid, and give characteristics of each which differentiate it from the others. 4. Give indications for curettage, and its dangers. 5. Define and give symptoms of vesicovaginal fistula, urethral caruncle, endocervicitis, and metritis.

PRACTICE (DIAGNOSIS) OF MEDICINE

1. Define the terms "contagious," "endemical," "epidemical," and "pestilential," and name two diseases in each class. 2. Name five diseases in which the ophthalmoscope is an important aid to diagnosis, giving reasons therefor in each. 3. Describe only the prodromal symptoms giving duration of each, in (*a*) measles, (*b*) scarlet fever, (*c*) chicken-pox and (*d*) small-pox. 4. Differentiate sunstroke, cerebral hemorrhage and alcoholic coma. 5. Describe four murmurs of the heart, giving name, cause, and state where each is best heard. 6. Name three causes for specific gravity of the urine, (*a*) under 1010, and (*b*) over 1030. 7. Differentiate hepatic, intestinal and renal colic. 8. How much, what, and how often would you feed a two-months-old bottle-fed infant? 9. Describe a typical cause of acute lobar pneumonia in its different stages. 10. Define bronchial breathing. Where is it heard normally? What does it signify when heard elsewhere?

SURGERY

1. Give signs and symptoms of popliteal aneurysm. 2. Give differential diagnosis of dislocation of hip from fracture of surgical neck of femur. 3. What do you know about intestinal intussusception? 4. Give etiology and symptoms of cerebral abscess. 5. Give symptoms of acute osteomyelitis. 6. What conditions demand amputation of an extremity? 7. What are the sources of wound infection? 8. Define enterocele. Epiplocele. 9. What are the causes of hemorrhoids? 10. What nerve may become involved and what paralysis follow in fracture of upper third of humerus?

HYGIENE

1. What is the cause of typhoid or enteric fever, and how is the disease transmitted from one person to another. 2. What prophylactic measures may be used in preventing its transmission? 3. What food contains all the elements of nutrition? 4. What are the difficulties and dangers surrounding its production, and how can they best be overcome? 5. Is the common house-fly a source of danger to the public health? If so, in what way does it become a menace? 6. What is meant by heredity? By environment? 7. What do you understand by occupational disease? Name some of the most important, and tell how they may be prevented.

JURISPRUDENCE

1. What is malpractice, and what general divisions are recognized in law? What is the maximum and minimum number of days for gestation in order that the offspring may be considered legitimate in the eyes of the law. 3. What is the difference between abortion and premature labor, and how are they regarded legally? 4. Under what conditions is the induction of an abortion justifiable? 5. In what respect does the evidence of a general practitioner differ from that of an expert witness?

MATERIA MEDICA AND THERAPEUTICS

1. Give a definition of serum therapy. 2. What is hexamethylenamin? 3. Belladonna leaves? Give official name, preparation, properties and dose. 4. Give official name of oxgall. Dose, properties and uses. 5. Magnesium sulphate. Give official name, dose, properties and uses. 6. Desiccated thyroid glands. Give official name, dose, properties and uses. 7. Give specific treatment for syphilis, and write prescription for chronic case. 8. Name three diuretics and in what condition they are used. 9. How would you treat a case of spasmodic croup in a child? Write prescription for same. 10. Potassium citrate. Dose, properties and uses.

HOMEOPATHIC MATERIA MEDICA AND THERAPEUTICS

1. What is a homeopathic prescription? 2. Upon what modalities is a homeopathic prescription usually based? 3. What are characteristic symptoms, and how are they determined? 4. What is the similimum? 5. Name any advantages that you believe lie in homeopathic prescribing. 6. What are provings, and how are they obtained? 7. Differentiate apis, arsenicum, and digitalis in dropsy. 8. Differentiate mercurius, caulophyllum and spigelia in acute rheumatism. 9. Differentiate gelsemium, veratrum vir, and opium in puerperal eclampsia. 10. Give treatment for renal colic.

Book Notices

A SYSTEM OF TREATMENT. By Many Writers. Edited by Arthur Latham, M.A., M.D. (Oxon.), F.R.C.P. (Lond.), Physician and Lecturer on Medicine, St. George's Hospital, and T. Crisp English, M.C., B.S., F.R.C.S., Senior Assistant Surgeon and Lecturer on Practical Surgery, St. George's Hospital. Vol. I, General Medicine and Surgery. Pp. 1352. Vol. II, General Medicine and Surgery. Pp. 1335. Vol. III, Special Subjects. Pp. 1194. Vol. IV, Obstetrics and Gynecology. Pp. 883. Many illustrations. Cloth. Price, $24 net. New York: Macmillan Company, 1912.

This is a work of almost encyclopedic dimensions, covering the entire ground of medicine and surgery by means of short articles by various authors. Such works are subject to limitations which make a general review very difficult, and a critical judgment must be founded on a thorough and detailed consideration of the entire work. The feature that perhaps is most striking is the brief space necessarily allotted to some seemingly important subjects. Thus the subject of congenital affections of the heart is dismissed with a dozen lines in which must be said that which is to guide the practitioner in dealing with what may be very difficult cases. It would seem that such space might be spared to other topics and the reader referred to text-books which will give him the necessary information as to diagnosis and symptomatology as well as treatment. Another point which must be noted is the attitude toward proprietaries and the readiness with which claims of doubtful validity are accepted by some of the contributors. An unfavorable impression is created by the article on typhoid fever. The following paragraph will probably be instructive to many of the younger American physicians who perhaps have never heard of the method of treatment described, but which is not mentioned in up-to-date American text-books. To others it will sound like an extract from a pamphlet of the previous generation.

"THE WOODBRIDGE TREATMENT.—This has been introduced in America and is much vaunted. The idea is to produce early in the disease a marked cholagogue, laxative and antiseptic effect by the use in small doses continuously repeated of podophyllin, calomel, guaiacol carbonate, menthol and eucalyptol, followed on the third or fourth day of the disease by the antiseptics and antipyretics guaiacol, menthol and eucalyptol only, with occasional use of the cholagogues. The prescriptions are made into tablets by Parke, Davis & Co., and sold with Woodbridge's directions."

The author seems to think as highly of this treatment as any other. If we take this as a sample of the modern point of view of the work we should perhaps do an injustice. In the treatment of auto-intoxication, however, we find no mention of diet or of the lactic acid bacilli as effective in such cases.

The authors of the various sections are evidently not troubled by any scruples as to the recommendation of proprietary remedies, and the zeal with which this liberty is used is sometimes startling. We have become accustomed to regard it as a blemish on American medical literature that some of our second-class journals permitted the recommendation of a number of nostrums, and it has been thought a proper subject of ridicule to quote examples of their indiscriminate mention. What better example could be cited than the following from W. Soltau Fenwick, who, in the treatment of achylia gastrica, says, "Pepsin, Pepsencia, Lactopeptin or the Peptenzyme Tablets may be prescribed." He says nothing of the necessity of accompanying them by hydrochloric acid. Again, in treating atony of the stomach he informs us without a hint of doubt that "the tabloids of Peptenzyme, which consist of a mixture of all the digestive glands, are occasionally of use."

Aside from the faults mentioned and some minor errors, the treatment in general is judicious and will meet the needs of the practitioner for whom it is designed. In the treatment of enuresis by Leonard Williams, thyroid extract in small doses is recommended. The author speaks further of the use by Zanoni and Ferari of suprarenal extract in doses of from 20 to 30 drops of a preparation which he says is not specified. Such an indefinite statement will be very puzzling to the reader who wishes to use this drug. Experiment with other organ extracts is recommended in cases which resist thyroid before resorting to atropin. Another example of recommendation of an indefinite remedy which may turn out to be a nostrum is the notice given to "Lactoserum" in arteriosclerosis. Such a serum is presumably produced by injecting an animal with milk, but the article gives no details as to what animal is used or what technic is followed. A considerable section is devoted to diseases and injuries of the esophagus, but the dilatation of the esophagus as the result of cardiospasm seems to have completely escaped the author's attention. The serum treatment of hemophilia is rather summarily dismissed on the ground that the danger of bleeding from the injection wound contra-indicates it. The articles on genito-urinary affections are thorough, and there are a number of terse summaries which enable the reader to gain a clear impression of the whole subject. In general the description of surgical treatment is good and is well illustrated. The fourth volume is devoted to obstetrics and seems to give the practical help which the practitioner needs. On the whole, we must conclude that the series constitutes a useful work, but we wish that it could have been better. It is a serious question whether a divorce of treatment from other departments of medicine is possible without sacrificing the proper point of view. Must not pathogenesis, symptomatology and etiology determine the treatment, and is it not true that the same name may cover different affections the treatment of which must be different? If this is true it seems that a careful condensation could give us in the same space a treatise on medicine in its entirety which would better meet the needs of the modern physician than the present or any other disconnected exposition of treatment alone.

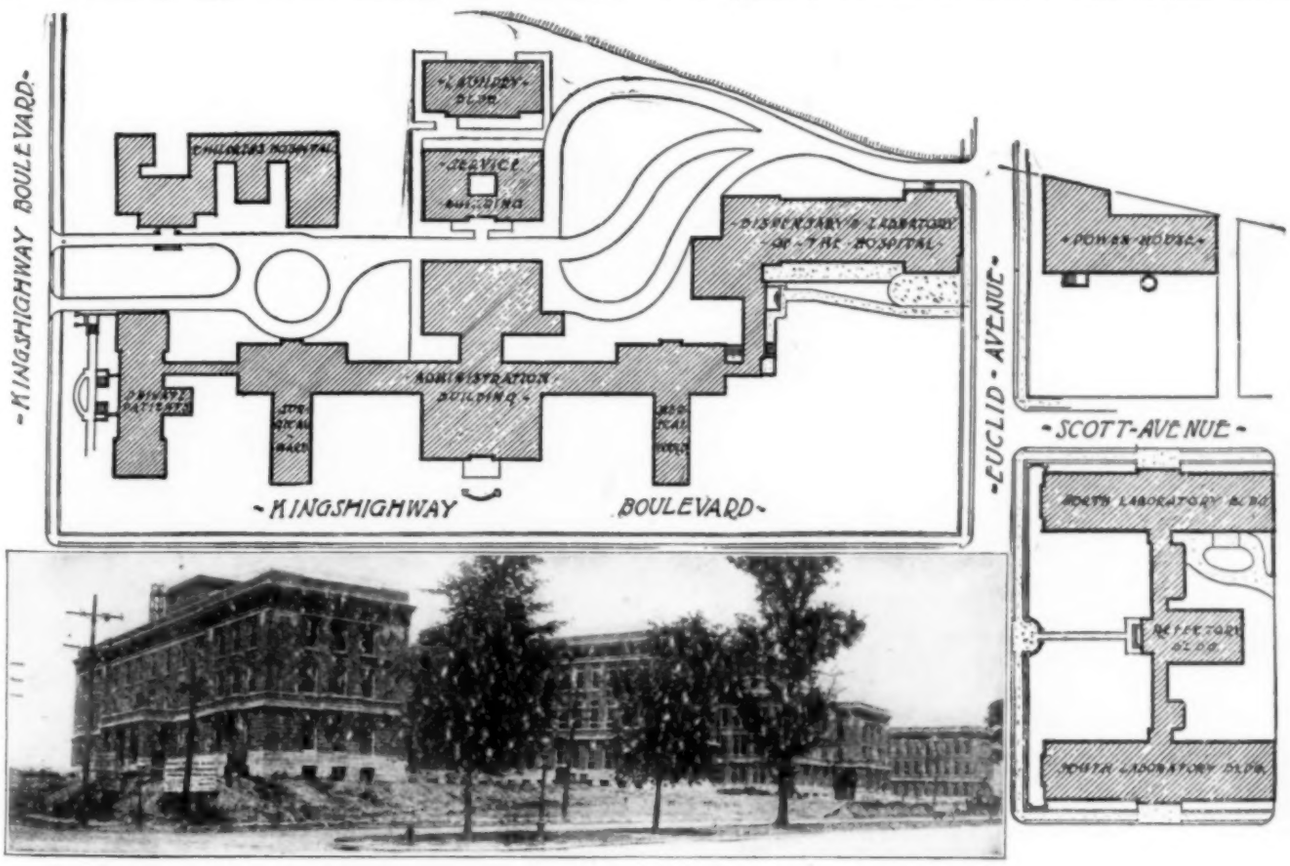
THE MODERN TREATMENT OF NERVOUS AND MENTAL DISEASES. By American and British Authors. Edited by William A. White, M.D., Superintendent of the Government Hospital for the Insane, Washington, D. C., and Smith Ely Jelliffe, A.M., M.D., Ph.D., Adjunct Professor of Diseases of the Mind and Nervous System in the Post-Graduate Medical School and Hospital, New York. Volumes I and II. Cloth. Price, $6 net per volume. Philadelphia: Lea & Febiger, 1913.

The somewhat unusual point of view from which this work regards the subject presented is deserving of attention. Instead of beginning with the physical as primary and making the psychic a mere appendage, the authors approach the diseases of the nervous system from a conception of life in which the psychic is deemed worthy of quite as much consideration as the physical. The authors think that previous writers have been too much concerned with details, such as disorders of gait, of power, of sensation and of related phenomena, to the neglect of the larger problem of the individual, the biologic unit and his social relations. "Practically all such works have stopped short where they should have begun. They have told us in large measure how to patch up broken machinery, but rarely have they ever suggested or given directions for avoiding the wrecks." The point of view is essentially therapeutic and optimistic. The attempt is made to give sufficient details so that the reader may apply the methods described with intelligence and confidence. The authors oppose the delegating of any of his functions by the physician to the clergyman or other agency. The physician alone is prepared to understand morbid phenomena, and to him is entrusted the task of correcting them. The field of mental disease is regarded as one of the most fruitful in preventive medicine, and consequently much space is given to discussing the sociologic relations of nervous and mental disease and to the influences of the social environment which tend to produce them.

The work is the result of the collaboration of a large number of contributing writers.

In carrying out their plan the authors have begun with the consideration of eugenics and heredity, and from this proceed to the treatment of sexual relations, impulses and ideas. The treatment of feeble-mindedness, and the social

and legal relations of mental defect are then discussed. The psychoneuroses receive extensive treatment. The first volume contains an article of considerable length on the influence of immigration on the incidence of mental disease. In dealing with the minor psychoses the method of Freud receives a thorough description, and the method of psychanalysis especially seems to have the thorough approval of the authors. The second volume deals with disorders of the peripheral nerves, the spinal cord, syphilis of the nervous system and organic diseases of the brain. Dangerous and habit-forming drugs and the surgery of the brain and spinal cord are treated in separate chapters. The value of this work to the medical practitioner must be judged by the fact that not only is he frequently called on to treat the functional nervous affections and minor psychoses and must deal with the first stages of the graver mental disturbances, but also he frequently has occasion to give an opinion or has the opportunity to influence public opinion in regard to the medicolegal and sociologic relations of these conditions. For these purposes the work seems to be an excellent guide.



New Barnes Hospital and Medical Building, Washington University.

Miscellany

MODERN HOSPITALS

During the last year new hospitals have been erected which are to be the teaching hospitals of two medical schools. These are the Peter Bent Brigham Hospital connected with the Harvard Medical School, Boston, and the combined Barnes, Children's and University Hospitals connected with the Washington University School of Medicine at St. Louis. New college buildings are also being erected for the latter medical school. The erection of these new buildings is another evidence of the remarkable development going on in medical education to-day, and is considered of sufficient importance to deserve mention here.

THE PETER BENT BRIGHAM HOSPITAL

Probably the latest word in hospital construction, architectural, medical and executive, is at the corner of Huntington Avenue and Francis Street, Boston, separated by a private way—Van Dyke Street—from Harvard Medical and Dental Schools, the Cancer Hospital, Children's Hospital, Infants' Hospital and the Carnegie Nutrition Laboratories. Here under the direction of Superintendent Herbert B. Howard, M.D., long known as the superintendent of the Massachusetts General Hospital, on a lot about 1,300 feet by 400 feet has grown up a group of fifteen buildings. Their arrangement connected by a three-story corridor as axis may be the result of the shape of the land but the perfection of detail everywhere evident can have come only from long study by the superintendent and his medical advisors, the trustees and the architects.

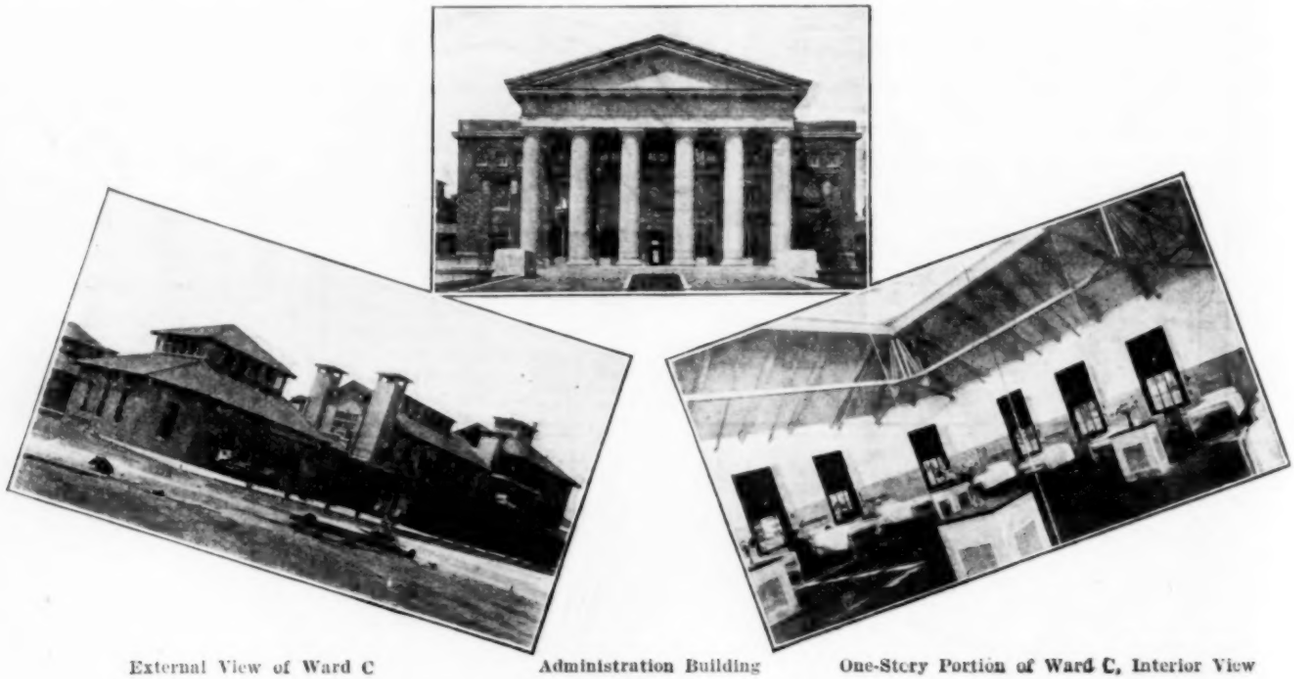
The architectural simplicity of the buildings of brick and cement construction is in marked contrast to the white marble of the buildings of Harvard Medical School close by. For this is not primarily a monument to Peter Bent Brigham but a "hospital for any indigent sick resident of Suffolk County whose disease is not contagious or chronic." For land and for the erection of the buildings $1,350,000.00 has been spent, leaving about $4,500,000.00 as a fund for the maintenance of the institution.

The diagram gives the general arrangement. Room is left for the enlargement of the nurses' home and the out-patient building, as may be needed, and for the erection of additional wards. The latter will be like Ward A with its small wards and private rooms, or like Ward C with its open wards and terrace-like structure. At one end each ward is of one story with a monitor top; the central portion is two stories with one large ward and two single rooms on each floor, and at the other end the ward is of three stories, the third story being for isolation purposes and open air treatment. This secures the maximum of light and air to every room and ward. Each of the other buildings to the north is set on a lower level and does not obstruct light or air even to the main wards. Around each ward are wide verandas. Doors everywhere are wide enough for the passage of a bed. The main doors are of heavy oak set in Braun iron frames. Others are light,

easily swinging double doors which, by a touch of the foot on a catch, become ordinary doors but are automatically released.

The Administration Building with its dignified pillared front proves that architectural beauty was not forgotten even if it was not made first in the construction of the hospital. Everything centers here at the desk of the clerk in the large rotunda which resembles the desk of a first-class hotel. He is closely connected with the Administrative Department. Every one must enter by the front gate and pass under his eye. There are no steps to climb. Even a wheel chair will easily enter. The single exception is the entrance for doctors and medical students on Vandyke Street, where there is ample parking space for automobiles. But they too must pass the watchful eye of the clerk. There are no back gates or doors.

Patients therefore easily walk or are rolled through the connecting corridor to the admission room in any ward. Adjoining is a large room for the admission bath. A sterilizing closet for clothing is available in one corner. Into bed at once and rolled to the ward is the rule, for every bed is a rolling stretcher. Each bed has easy running wheels with tires of canvas and a little rubber which will not dent on standing. Two of the wheels are on swivels so that one person can control, but can be locked firmly when in the proper location. These beds are the result of long study and their success is attested by the fact that the nurse herself rolls her patient through the wide door into the open air when she wishes without calling for the aid of an orderly. A patient suspected of having a contagious disease is rolled to the elevator in any building, carried to the third story and kept in an isolation room or in the open air. If a contagious disease develops, he is taken down in the elevator still in his bed, and from the open air of the corridor removed to the contagious hospital. This secures a minimum exposure of other patients.



External View of Ward C — Administration Building — One-Story Portion of Ward C, Interior View

Peter Bent Brigham Hospital

The Hospitals and New Medical School of Washington University

Three years ago a gift of approximately $3,000,000 from four prominent citizens of St. Louis—William K. Bixby, Adolphus Busch, Edward Mallinkrodt and Dr. Robert S. Brookings—was announced as having been given for the development of the Washington University School of Medicine. Just previous to that time the trustees of the Barnes estate had determined to erect a new building for the Barnes Hospital and the trustees of the Children's Hospital likewise were planning to erect a new building for that institution. Fortunately, a close affiliation of all these institutions was formed and it was determined to have a group of new buildings erected in close proximity on a tract of ground at Kingshighway and Euclid Avenue. It was recognized that the hospitals would need an attending staff of high efficiency which Washington University agreed to furnish. On the other hand, it was evident that the medical school needed to have in connection a large modern hospital. In the affiliation agreement between Barnes Hospital and Washington University the latter institution was to erect the new building at an initial cost of approximately $1,000,000, the maintenance to be met from the income of the hospital's endowment—approximately $2,000,000. Thus it was planned to have Washington University Medical School, the Washington University Hospital, the Barnes Hospital and the St. Louis Children's Hospital, formerly widely separated in different parts of St. Louis, brought together and affiliated into practically one institution centering about the Washington University School of Medicine. Plans for the new buildings were carefully prepared along strictly modern lines. The style of architecture used may be called a modified and modernized Colonial. The floors are generally of marble, tile or battle-ship linoleum; wood has been sparingly used. For the walls, marble, glass, enameled brick and tile have been freely employed, not so much as decorative features, however, as in places where sanitary reasons recommended their use. The exterior walls are constructed of an impervious gray brick on all sides, and trimmed with limestone. The cornices and copings are of limestone. The buildings are now rapidly approaching completion. The general relationship of the various structures and the appearance of the buildings when completed are shown by the accompanying cuts. This group consists of the buildings of Washington University School of Medicine, the Barnes Hospital, the St. Louis Children's Hospital and the building for Department of Pathology and the Dispensary. Two other buildings proposed are a Nurses' Home and a Maternity Hospital. All buildings, with the exception of the last two, are expected to be ready for occupancy by Jan. 1, 1914.

Thus we have another great work accomplished in the recent remarkable development of medical education in the United States. The close affiliation formed between the hospitals named and the Washington University School of Medicine are in accordance with the positive trend of the time. It is clear that the three principal functions of an ideal hospital are: (a) the best care of the sick; (b) the training of medical

men for the future, and (c) the advancement of medical knowledge. No one of these functions is well performed unless all three functions are being fulfilled. The best conducted hospitals of the day are entirely those which are in close relationship with strong up-to-date medical schools. These seem to be the accepted ideals at the new Medical School of Washington University and its affiliated hospitals.

Medicolegal

Right of Health Officers to Compensation—Acting without Proper Authority

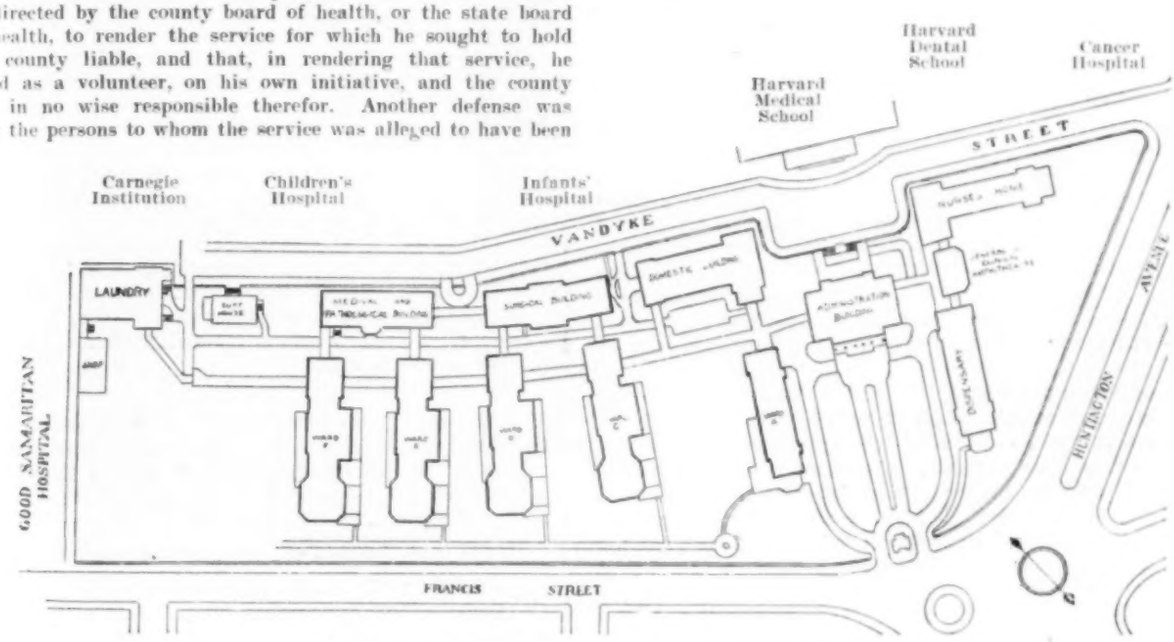
(Hickman County vs. Scarborough (Ky.), 149 S. W. R. 1116)

The Court of Appeals of Kentucky reverses a judgment recovered by Dr. Scarborough, the plaintiff, for services as health officer of Hickman County, holding that, on the showing made, a verdict should have been directed for the defendant county. The court says that the plaintiff, conceiving that his rights were fixed by an order or resolution of the fiscal court of the county fixing the compensation of the health officer, rendered services for which he sought to recover $324, but the defense was interposed that he was not ordered or directed by the county board of health, or the state board of health, to render the service for which he sought to hold the county liable, and that, in rendering that service, he acted as a volunteer, on his own initiative, and the county was in no wise responsible therefor. Another defense was that the persons to whom the service was alleged to have been rendered were financially able to pay the bills, and that, therefore, the county was not chargeable therewith.

On the question of the financial condition of the patients treated by the plaintiff for the services to whom he sought to hold the county liable, the burden of proof was on the county. The proof failed to support the allegations in the answer that these parties, or any of them, were financially able to meet the expense themselves; and hence, if the service was in fact rendered by the plaintiff in his official capacity as health officer of the county and while he was proceeding as directed by the statute, the county should be required to pay the contract price, if the order adopted by the fiscal court, and on which the plaintiff relied, was a valid and binding contract; or, if this order was invalid, then the county should be required to pay the plaintiff for such service its reasonable value.

Section 2055 of the Kentucky Statutes makes it the duty of the fiscal court to fix the compensation of the health officer by allowing to him a salary. The evident purpose and object of the legislature in passing this act was to prevent controversies between the health officer and the fiscal court growing out of questions of this character. But, as it is the plain duty of the county to meet the legitimate and proper expenses of the health officer, when he proceeds in the way and manner as by statute directed, the failure of the fiscal court, in advance of the service rendered, to fix a salary as compensation for the health officer, could not have the effect of defeating him in his effort to collect for such service the reasonable value thereof.

The serious question presented by the record was: Did the health officer act on the direction of the county board of health, or was he acting on his own initiative? The uncontradicted evidence of the plaintiff himself, as well as that of the chairman and another member of the county board of health, showed that a blanket instruction had been given him to look after the sanitary and health conditions of the county, and to take such steps as, in his judgment, were necessary to prevent the spread of contagious and infectious diseases. The record did not show just when this blanket instruction was given. There was no evidence that the record kept by the county board showed that such an instruction was given; but it was unnecessary that there should be a record to this effect. If, in fact, the county board passed such an order, it might be proved by oral evidence. There was no showing that at the time this general authority was given there was prevalent in the county any contagious diseases. The services rendered by the plaintiff were in two isolated cases. He acquired his knowledge of their existence usually in this way: The physician in attendance would call him up by telephone, or otherwise notify him, that there was, at a certain place, a patient apparently suffering from a contagious disease. The plaintiff would thereupon visit the patient, and, if his diagnosis of the case led him to believe that his informant was correct, he would take the steps proper and necessary to prevent the spread of the disease. When he would thereafter meet members of the county board, he would tell of the way and manner in which he was discharging the duties of his office. On one or two occasions he met as many as two members of the county board of health, physicians, and discussed with them certain cases, which were then being treated by him, and was advised that he was proceeding with the work to the satisfaction of the board. It was apparent from the testimony of the chairman of the board of health that he regarded the law as fully complied with by issuing to the health officer a general instruction to go ahead and look after the sanitary and health conditions of the county; and hence he did not deem it necessary to call a meeting of the board to give explicit directions concerning any particular case; and this undoubtedly was the reason why the board did not meet and take



The Peter Bent Brigham Hospital and Its Surroundings

action on the several cases which were treated and looked after by the plaintiff. The county board intrusted to the plaintiff the discharge of the duties which were, by Section 2055, imposed on it. On this showing the court should have directed a verdict for the county.

The county board can, when acting within the jurisdiction conferred on it by statute, bind the county. But the health officer has no such power. He is a mere ministerial officer, a creature of the board, charged and instrusted with the duty of carrying out its orders. His duties are defined and fixed by the statute, and it is only when he acts under the order and direction of the county board that the county is responsible for expenses incurred or made by him. Not only so, but he must have the authority, in each case, in advance of any action on his part looking toward establishing a quarantine, or doing any other act for which a claim is to be made against the county.

Licensed Physician Employing and Aiding Unlicensed Person to Practice Medicine

(Gobin vs. State (Okla.), 131 Pac. R. 546)

The Criminal Court of Appeals of Oklahoma affirms the judgment as to each of the defendants, O. O. Gobin and R. W. Freeman, who were charged with practicing medicine without a license, and convicted, a fine of $250 and sixty days' imprisonment being imposed on each as the punishment. The court says that much testimony was introduced on behalf of the state, but that it was necessary to consider only the testimony introduced by the defendants. Gobin admitted that he had no license to practice medicine in Oklahoma; that he was in the employ of Freeman on a salary; was practicing medicine as the assistant of Freeman; was collecting fees for his services and paying them over to Freeman. Freeman in his defense introduced a certificate from the state board of medical examiners authorizing him to practice medicine and surgery in the state. He testified also that Gobin was in his employ on a salary; that Gobin was practicing medicine under his directions and receiving fees therefor which were turned over to him.

There was no question but that Gobin's conviction was entirely proper, and the judgment as to him should be affirmed. Freeman, however, had the required certificate, and so far as his own acts were concerned independent of Gobin he could not be convicted. On the prosecution of a person charged with violating the medical practices act on the ground that he does not possess an unrevoked, valid certificate from the state board of medical examiners, the production at the trial and the introduction in evidence of such certificate is a complete defense of such charge. This rule, however, is not intended to, and does not, protect such person from prosecution if he aids and abets another to violate the medical practice act in so far as his connection with such other unauthorized person is concerned.

A person who does not possess a valid, unrevoked certificate from the state board of medical examiners is not entitled to practice medicine under the laws of Oklahoma, except in emergencies and such other cases as are specifically exempted by the statute, and this is true even though he works with or under the directions of a duly authorized practitioner; and it is immaterial whether he works for a fee, percentage, or on a salary.

The trial judge instructed the jury that if they found beyond a reasonable doubt that the defendants Freeman and Gobin entered into an agreement by the terms of which Freeman signed up prescriptions in blank to be used by Gobin in his absence, by filling in such prescriptions over the name of Freeman, and prescribing medicines for patients for a compensation, and that pursuant to such agreement between them Freeman did leave prescriptions signed in blank by him for Gobin, and did authorize Gobin to receive patients in his absence and to treat and prescribe for such patients for a compensation, from said patients to Gobin, or to Freeman, or to both Gobin and Freeman, and that Gobin did it, and further found, beyond a reasonable doubt, that Gobin did not have the certificate required by law to practice medicine and surgery, then it would be the duty of the jury to find both Freeman and Gobin guilty, although they should find from the evidence that Freeman did have a valid certificate from the proper state authorities to practice medicine and surgery.

Section 2045 of the Compiled Laws of Oklahoma, 1909, provides that "All persons concerned in the commission of a crime, whether it be a felony or a misdemeanor, or whether they directly committeed the act that constituted the offense or aided and abetted in its commission though not present, are principals." Under this statute, Freeman, if he aided and abetted Gobin in a violation of the medical practices act, would be guilty and subject to punishment, not because he (Freeman) did not have a license to practice, but because Gobin did not have, and because he (Freeman) aided and abetted Gobin in the commission of the offense. It was not contended that Freeman did not know Gobin was without authority to practice medicine in Oklahoma.

The law and instructions of the court properly applied to the facts were such that the jury would not have been warranted in finding Freeman guilty of practicing without a license. But, under the instruction of the court quoted and the facts, the jury was authorized and fully warranted in convicting Freeman of aiding and abeting Gobin in case it found from the facts that Gobin did not have a certificate or license to practice medicine in the state.

The medical practices act does not any more contemplate or authorize a registered physician going out and employing all the unauthorized quacks in the country to aid and assist him for a compensation or otherwise, except in emergencies, in the practice of medicine, than it does the employment for the same purpose of the section hands on a railroad. The law is not only intended to protect legitimate practitioners, but also to protect the public against being imposed on by an incompetent person holding himself out as a physician. The laws of this state were enacted to be observed and enforced and not to be evaded and violated. It is evident from this record that the defendant Freeman was seeking to aid Gobin in evading the law, and in doing so both of them violated it and incurred its penalties.

Circumstances Entitling Physician of One State to Compensation for Services Rendered in Another—Construction of New Jersey Statute—Authority of Wife to Employ Physician for Husband in Hospital—Basis of Compensation—Counterclaim to Mortgage

(Prentice vs. Ladinski (N. Y.), 141 N. Y. Supp. 1005)

A special term of the Supreme Court of New York, New York County, allows compensation to the defendant, a physician and surgeon of New York, for services rendered in New Jersey. The court says that the action was brought by the plaintiff, as trustee in bankruptcy of the estate of one Hayman, bankrupt, to foreclose a mortgage given by the defendant to another party, and by the latter assigned to Mr. Hayman. The defendant set up a counterclaim of $2,500 for medical services rendered to Mr. Hayman in his last illness. Mr. Hayman, harassed by business troubles, had attempted to commit suicide at a hotel in Newark, N. J., whence he was removed to the Newark City Hospital. His wife was communicated with, and she had the defendant summoned, who came to the hospital the same afternoon, which was Sunday, and was thereafter in constant attendance on the patient until Thursday evening. He then was absent from the hospital until Friday morning, and remained until Friday night, when he finally left, having given up hope. The patient died Saturday morning. When Mr. Hayman was first taken to the hospital, which was a public hospital, treating patients without pay, he was put in a public ward with other patients; but after the defendant's arrival he was transferred to a room reserved for special cases, and which he occupied alone. While the rules of the hospital did not permit the defendant formally to take charge of the case, the hospital physicians and surgeons extended to him every courtesy and all the freedom which the rules of the hospital permitted. The defendant was in con-

stant attendance at the bedside of the patient, and his suggestions as to treatment were complied with, and some treatment he himself administered. At his suggestion an operation for transfusion of blood was performed. Another surgeon, also of New York City, was, on the recommendation of the defendant, called in to perform this operation.

The evidence, the court holds, did not warrant the inference which the plaintiff sought to draw that the defendant rendered the services in question as a friend, and not for compensation. The defendant had been Mr. Hayman's physician for years. It was also true that he had been an intimate friend of his. While this circumstance might have had the effect of rendering his professional services to his friend more assiduous and more anxious than they might otherwise have been, it manifestly did not change the character of the services. The failure of the defendant to make any charge on his books for this service and to send a bill for the same had no particular significance, because he knew that the estate was bankrupt, and, as he explained, he did not, until afterward, understand that he was entitled to make a charge for his services as a counterclaim to the mortgage.

The plaintiff also argued that, although a licensed physician of another state not licensed in New Jersey may act as a physician or surgeon in that state if he desires, without rendering himself subject to punishment, yet he may not recover fees for such service. Without quoting and going into an examination at length of the New Jersey statutes on this subject, the court thinks that those statutes were not intended to prevent the recovery of compensation for medical services rendered under such circumstances as those proven in this case.

It seems to the court that the purpose of the New Jersey statute, when read as a whole, is clear, and that it is only those who either reside or sojourn in the state of New Jersey that are subject to the requirements of the act, and that the legislature intentionally left entire freedom to physicians of other states to render professional services within the state of New Jersey in an occasional way, as distinguished from opening an office or appointing a place to meet patients, which latter, it is expressly provided, shall constitute a practitioner a sojourner in the state and subject him to the requirements of the act. It is a matter of common knowledge that great numbers of residents of New York state and Pennsylvania spend a large portion of their summers in New Jersey, and it is quite evident that the legislature of the state of New Jersey meant to leave entire freedom to such residents to call their regular family physicians, or such physicians as they might select from other states, to render them professional service. But whether or not the court is right in its construction of the New Jersey statute, it thinks that this case might, if necessary, be decided irrespective of the New Jersey statute, as the parties were all residents of New York state, the contract was made in that state, and the action was brought in that state.

Passing to the question of the authority of the wife to employ the defendant, the court does not think that in this case there could be any serious question as to such authority. She employed the same physician that her husband had been in the habit of employing for years. It was plain from the evidence that the condition of the patient was so critical that the physician was warranted in remaining in constant attendance. The wife was also at the hospital during the entire time and was aware of the continuous attendance of the physician. It was not incumbent on the wife to send the defendant away, on the theory that the hospital physicians could and would render all the service necessary. The case was a most critical one. If the patient's life was to be saved, the unremitting attention of a skilled physician was called for; and such attention could not, in the nature of things, be received from the hospital physicians, there being between three hundred and four hundred patients at the time in question.

But as to the compensation to be allowed the defendant, the court is in accord with the contention of the plaintiff that, although the evidence showed the defendant to be an operating surgeon of great skill, nevertheless for his attendance on this patient he should be compensated rather on the scale of charges for services of a family physician than the much higher scale of services of an operating surgeon. He performed no operation. The operation that was performed was performed by another surgeon of his selection; he himself being so worn out by his vigil of the night before that he was not in condition to perform it. The testimony of the numerous medical experts as to the value of the services rendered varied widely. On consideration of all that testimony and of all the facts in the case, the court fixes the compensation for such services at the sum of $750, to be deducted from the amount remaining unpaid on the mortgage.

Society Proceedings

SEVENTEENTH INTERNATIONAL MEDICAL CONGRESS

August 6-12, 1913

(From Our Regular and Special London Correspondents)

(Continued from page 701)

Section on Surgery

Sir W. Watson Cheyne presided at the first meeting (Wednesday, August 6) of the Section on Surgery in the Physics Theater of the Imperial College. He was supported on the rostrum by the Secretaries of the Section, Mr. D'Arcy Power, Mr. Raymond Johnson, Professor Thorburn, Professor Sinclair, while on the benches many of the most distinguished surgeons of the day were seen, among them Professor Lucas-Championnière and Professor Hartmann of Paris, Professor Freiherr v. Eiselsberg of Vienna, Professor Dollinger of Budapest, Sir William Macewen of Glasgow and Professor Oskar Bloch of Copenhagen.

The President's first word was one of welcome. He could not help, he said, contrasting the condition and scope of surgical science of the present day with that of a generation ago when the Congress last met in London in 1881. That date seemed to him to mark the close of the old régime and the introduction of the new. The men who had laid the foundations of the great superstructure of surgery were no longer with them. And they were still mourning the loss of Lister, the greatest genius in surgery, the man whose work and love for humanity had brought light and health and rejoicing to countless homes. Surgery had far outstripped medicine in the progress of her art. But he would not like to say what new developments might not open up to medicine, so that in another thirty years' time the relative positions might be reversed. At present they removed large portions of the body to cure disease, but that could only be justified till such time arrived when disease would be cured by other means developed along the lines of serum and vaccine therapy.

Professor Lucas-Championnière followed with a warm-hearted, eloquent tribute to the memory of Lister. Professor Freiherr v. Eiselsberg and Dr. Oskar Bloch spoke also in the same strain.

Dr. G. Le Filliâtre of Paris read the first paper on spinal analgesia. He presented statistics of 116 cases of patients in a very weakly or cachetic condition on whom he had operated with the aid of spinal analgesia in lesions of the head, neck, thorax, stomach, liver, kidneys and lower limbs. In every case the anesthesia was perfect, and in those cases which for the most part could not otherwise have received the benefit of surgery the operative mortality was only 3.5 per cent. The author concluded that operative shock was nothing more nor less than shock due to general narcosis by chloroform or ether and that shock disappeared with his method of producing analgesia and the mortality sank almost to nil in these extremely feeble patients.

This question was discussed by Professor Dollinger (Budapest) who advocated local anesthesia preceded by morphin, and who had performed cholecystectomy six times by this method, by Prof. von Eiselsberg (Vienna) whose preference was for general anesthesia in children, and by Professor Hartmann (Paris) who was totally in favor of general anesthesia, especially in abdominal work.

Surgery of Gastro-Intestinal Conditions

Mr. Herbert J. Paterson (London) in a paper on "The Physiology of Gastrojejunostomy" presented arguments in favor of regarding the benefits which follow gastro-enterostomy as due to physiologic processes and not merely to mechanical drainage, which were supported by statistics of gastric analyses. He concluded that a certain amount of bile and pancreatic juice entered the stomach after this operation, that the total acidity of the gastric contents was diminished by 30 per cent., that gastric digestion was impaired but not lost after the operation, and that the mobility was unaltered except in pyloric stenosis. He thought that occlusion of the pylorus was an unnecessary complication of gastrojejunostomy, and that excision of simple ulcers was not required, and further, in his view it was contrary to clinical experience that malignant degeneration of gastric ulcers was frequent after gastro-enterostomy.

"Pancreatitis and a New Factor in Its Causation," was the title of an original contribution by Dr. E. Archibald (Montreal). Clinically he had observed that when a gall-stone occupied the ampulla of Vater bile was dammed back and could force its way up the pancreatic duct. Before this could happen it necessarily must overcome the restraining action of the sphincter at the outlet of the duct of Wirsung. He had made some experiments to find out how much pressure was required to accomplish this and found that generally a pressure five or six times greater than the ordinary bile pressure sufficed. In a case of pancreatic cyst in the clinic of Dr. Armstrong of Montreal he had examined the fluid and found bile. The keynote, therefore, of the treatment of certain forms of pancreatitis was not drainage affecting the pancreas or its duct, but reduction of the excessive pressure in the biliary system by cholecystostomy. He suggested that a proper operation for certain cases of chronic and subacute recurrent pancreatitis would be cutting this sphincter in the ampulla.

Dr. L. Mayer (Brussels) in a short paper on the subject urged the advisability of more extended employment of transverse incisions in abdominal work.

In the absence of Dr. Russell S. Fowler (New York) his communication on the "Elevated Head and Trunk Position in the Surgical Treatment of Abdominal Lesions" was read by Dr. Polak (Brooklyn). The paper narrated the circumstances under which this now well-known therapeutic measure was discovered and detailed the anatomic and mechanical basis on which it was founded. He was still convinced that it contributed largely to the lowering of the death-rate, but he had no new facts or theories to offer.

Nor was there much that was new in the contribution of Dr. Waters F. Burrows (New York) on "Postoperative Intestinal Stasis" and the intra-abdominal use of oil. This measure has been known to surgeons for over two years and was suggested by Dr. D. P. D. Wilkie at the meeting of the British Medical Association in 1911 as a means of preventing the formation of adhesions in acute septic peritonitis. Dr. Burrows held that apart from the gross complications which might occur after an abdominal operation there were sometimes symptoms of obstruction which he thought were associated with regional or segmental gut spasm. This spasm occurred mostly in the small intestine and probably it could be referred to more or less minute traumatism arising in the manipulations of the operation. The evil effects of these abrasions could be combated by pouring about 6 or 8 ounces of "oleum petrolatum" into the abdominal cavity so that a coating of oil would prevent adhesions and promote the normal peristaltic movements. He had carried out a series of experiments to show the harmlessness and value of neutral mineral oil so used.

Professor Krynski (Warsaw) presented notes of a case which induced him to argue for the recognition of cirrhosis of the mesentery as a clinical entity. The patient had suffered for twenty-two years with abdominal pain, irregular attacks of constipation and diarrhea, great increase in size of the abdomen, and palpable tumor. Ileocolostomy resulted in great improvement. The condition was a chronic inflammatory process; a fibrosis characterized by superabundant development of connective tissue and loss of fatty and elastic tissues.

The second meeting of the section (Thursday, August 7) was devoted to "Discussion of the Operative Treatment of Malignant Disease of the Large Intestine, Exclusive of the Rectum," the essayists being Professor Rafaele Bastianelli of Rome and Professor Körte of Berlin. Professor Körte's paper was an elaborate study of the subject, replete with historical references and statistics drawn from all sources. The particular dangers of resection of the large intestine for malignant tumors, collapse and peritonitis, depended chiefly on the anatomic relationships of the resected portion of the bowel as well as on the difficulty of preventing soiling of the peritoneum. In acute intestinal obstruction it was possible only to adopt a simple procedure for emptying the bowel, namely, colostomy, with the intention of going on to perform a secondary radical operation in two or three stages.

In chronic slowing of the intestinal flow the two or three-stage operation by suture (colostomy, resection of the tumor, closure of the colostomy) was the most certain operation, though the slower method. Where it was possible to thoroughly empty the bowel, insure perfect hemostasis and absence of tension of the sutured bowel-ends, the one-stage resection and suture was best. The various anatomic relations of different portions of the great intestine demanded various operative procedures. The expectation of long-standing healing was relatively favorable in carcinoma of the great intestine. As regards palliative operations, entero-anastomosis in the absence of obstruction was the best operation. Colostomy, and that may mean cecostomy, was the method of choice where obstruction existed. Colectomy or entero-anastomosis was to be performed secondarily to emptying of the bowel.

Professor Bastianelli (who spoke in English) said that surgeons should adhere to the principle of not interfering with the primary tumor if obstruction existed. Only in some cases of tumor of the cecum was it possible to risk violating that principle, and mainly because an artificial anus in the cecal region was highly objectionable. But in the case of a left-sided tumor, formation of the cecal anus was the operation of choice. He had never seen exhaustion result from the existence of an artificial anus. The ideal operation was primary excision of the tumor in one stage; it certainly was the operation of choice in right-sided tumors, and was applicable in all except tumors situated low on the left side where primary suture was practically impossible. The removal must be thorough and must include not merely a large portion of adjacent bowel, but the lymphatic apparatus as well. The death-rate in right-sided tumors was 9 per cent., and the left side 15 per cent. Modern technic could not bring about great improvement in the results of palliative operations; these results really had nothing to do with the operation itself, but depended on the patients's condition. As to radical operation, the principle must be strictly adhered to not to attempt it in the presence of complications. The comparatively slow growth of the neoplasm with its late lymphatic and visceral dissemination and the possibility of earlier diagnosis were important factors to consider.

Dr. A. L. Soresi (New York) demonstrated a method of end-to-end suture of the bowel which simplified the operation and permitted it to be accomplished by means of only one row of sutures. But as it appeared to require the employment of a piece of rubber tubing which was left in the lumen it was not regarded by some members of the section as an advance.

Statistics were contributed by Sir Frederic Eve (London). He was of the opinion that unless the local and general conditions for primary resection were distinctly favorable the average operator—in the London Hospital sixteen surgeons in all werre responsible for the work—would best consult the safety of the patient by doing the three-stage operation. The mortality had not increased since the extensive modern radical operations came into vogue; the mortality of resection with small margin of healthy bowel was 52.5 per cent., whereas the extensive operations of the Jamieson and Robson type had a mortality of only 29 per cent.

Mr. Charters Symonds suggested that resection should be performed even in the presence of metastasis in the liver provided it were not extensive and instanced a case in point in which a patient lived for nearly two years after resection even though there was a small metastatic deposit visible in the liver. Similarly in the anemia found in such cases he thought it might be sometimes advisable to remove the original tumor and he had known the anemia to disappear completely after so doing.

Appendicostomy in preference to cecostomy in irremovable cancers was urged by Mr. W. G. Spencer (London). He held that if a large catheter (14 English) were introduced through the appendix into the cecum in such a way that fluid could be run in and fecal fluid siphoned off, it was a sufficient and a more suitable mode of treatment than the artificial anus. He did not believe that the regular passage of feces irritated a cancer of the colon.

Short contributions to the debate were made also by Mr. H. J. Paterson (London), Prof. A. E. Barker (London), Professor Krynski (Warsaw), Dr. Keppich (Budapest), Dr. J. B. Murphy (Chicago), Professor Hartmann (Paris) and the essayists replied.

Professor Bastianelli held that the one-stage operation was the ideal one; there was a technical as well as a clinical ideal to be sought. Very extensive operations were sometimes easier to do than limited ones as then the bowel could be brought outside the wound in the abdominal wall. Whether the pathologists were right or not, in regarding distant permeation as the rule, he favored operations of wide scope. He associated himself with Professor Körte in hoping for earlier diagnosis, but meanwhile early diagnosis was difficult and problematic.

At the afternoon session of August 7 Dr. Angelo Chiasserini (Rome) read a paper on "Experimental Inflammatory Lesions of the Hypophysis and of the Hypophyseal Region." The experiments were performed on dogs and were carried out by inoculating that region with tuberculous material and with sporotrichosis. The result of his investigations was to show that quite definite inflammatory changes took place.

Dr. F. H. Albee (New York) gave an account of 175 cases of transplantation of bone, the grafts being taken from the tibia. Of these cases 145 were cases of spinal curvature. His work is well known in the United States.

Dr. J. B. Murphy (Chicago) then gave a lantern demonstration of the clinical results attained in "Arthroplasty and Osteoplasty." His work is familiar to the profession in the United States.

Dr. H. Eckstein (Berlin) gave a lantern demonstration of the results he had been achieving in the rectification of nasal defects. The ordinary type of saddle-nose could be readily treated by injection of hard paraffin and he was also able in many cases to make good the loss of the tip of the nose by similar injection. Dr. Stein (Wiesbaden) criticized the employment of hard paraffin and held that soft paraffin was less likely to give rise to embolism and thrombosis.

The last paper for the day was read by the secretary on behalf of Prof. R. Minervini (Naples). He advocated the employment, where possible, of whole skin grafts taken from newly-born babies who had died within a few hours after birth. He was able in five cases to make excellent use of large grafts obtained in this way.

Discussion on Renal and Vesical Tuberculosis

The fourth session (Friday, August 8) of the Surgical Section consisted of a joint meeting with the Section of Urology to discuss "The Diagnosis and Treatment of Early Renal and Vesical Tuberculosis." Professor Rochet of Lyons and Dr. Hans Wildbolz of Berne were the essayists.

Professor Rochet deprecated any attempt to formulate definite and precise rules in a question so delicate and so diversely regarded by acknowledged authorities. In regard to unilateral kidney tuberculosis a "granular" lesion discrete and not deeply placed seemed inevitably to go on to an ulcerating and caseating stage with fatal termination, but there was no proof that this early condition did not, as in other organs, heal. The diagnosis of this early granuloma, not yet ulcerocaseous, was obscure and difficult. In a patient suspected to suffer from early tuberculous disease and in whom the urine from one kidney contained bacilli with positive inoculation of guinea-pig he would not advise immediate operation, but would wait for three new conditions to develop: (1) a slight degree of pyuria, (2) a certain diminution of the functional value of the diseased kidney, and (3) such complications as serious repeated hemorrhages, pyrexia, anemia and bladder symptoms. Whenever symptoms pointed to formation of ulcer or caseation, operation was called for. As to specific treatment by tuberculins, antituberculosis serums and immunizing substances, he had to admit that his experience was limited, though he did not think they could do all that was claimed for them. The treatment by the immune bodies of Spengler he did employ in the expectant period, and he thought with some success. These bodies are obtained by extraction from red blood-cells of rabbits immunized to tuberculosis.

In bilateral kidney tuberculosis the lesions were probably not equal on both sides. In these conditions specific treatment was indicated.

Early tuberculous infection of the bladder in so far as it was almost inevitably due to secondary infection from the kidney (90 to 95 per cent.) was cured when the kidney was treated. In treatment of bladder disease persisting after nephrectomy, or in the few cases of primary infection or after infection from the genital organs, he advocated washing the bladder with creosote solution and administration of pills composed of iodoform, arsenate of soda and creosote. Specific treatment could be used only in cases in which vesical infection was associated with advanced renal and genital disease.

Dr. Hans Wildbolz observed that early tuberculosis did not refer simply to the patient's first symptoms, as he had known cases to be tolerably advanced before the patient sought advice. He had found a kidney three parts cavernous in a patient who for only ten days had complained of urinary symptoms. In over 300 cases of tuberculous kidney examined by him only twenty-five were in the early stage; in all the others the disease was advanced. He indicated some symptoms which drove the patient in the early stages to his physician—disturbance of general health, lessened vigor and ability for work; local signs referred in more than two-thirds of the cases to the bladder (Rafin) (43 per cent. of his own cases complained of cystitis); kidney pain of dull or occasionally neuralgic character; frequency of micturition, sometimes incontinence; pain in the bladder even before that organ became infected; hematuria, a common early sign (out of 300 cases he found it only twice as the first symptom), was sometimes very severe. Then the urologist was able for himself to observe persistent slight albuminuria, polyuria, alternations in blood-pressure (it was necessary to exclude chronic nephritis in which polyuria and albuminuria were also found), acidity of the urine, pyuria, cystoscopic examination (often negative, though he had observed redness and infiltration of mucous membrane not specifically tuberculous). In 70 to 80 per cent. of all cases tubercle bacilli were found in centrifugalized urine, but inoculation experiment was the surest test. It had to be kept in mind that tuberculous bacilluria had been found in cases of phthisis in which neither kidney, bladder nor genital organs were infected.

The diagnosis of tuberculous disease of the kidney with present-day methods could be made with certainty only when pus cells and bacilli were found in the urine of that kidney whose function was unmistakably though slightly disturbed.

Tuberculin treatment in the early stage had had more claims put forward on its behalf than any other. But it seemed to him that for only very few recorded cases could the claim of permanent cure be sustained. He gave his own experience of thirteen carefully observed cases in which treatment had been conducted for from one to four years, and his conclusion was that not a single one of them could be said to be cured, and eight later required nephrectomy. The results of early nephrectomy seemed good on the whole, but the cases were too few to found conclusions on. He believed, however, that as soon as unilateral tuberculous disease of kidney was with certainty diagnosed, that kidney should be removed.

Dr. A. Fullerton (Belfast) pointed out that the disease might progress rapidly so as in a few weeks to render the patient's life intolerable or it might go on for ten years with but little disturbance. Hope of spontaneous cure was not to be relied on. He had had only three cases of primary disease of the bladder. The absence of pus and albumin were not absolute proof of the integrity of the kidney. Tubercle bacilli were found in 80 per cent.; frequent examinations for the bacillus were necessary. The cystoscope and ureteral catheter were the most important instruments of diagnosis. Removal of the affected kidney was the only absolute cure.

Professor Kümmel (Hamburg) had had 60 per cent. cures after nephrectomy. Tuberculin was on the whole a dangerous form of treatment because it raised false hopes on account of the undoubted improvement following its use in the first weeks or months.

Dr. Van Houten (The Hague) treated bladder infection (which was always secondary to kidney disease) with silver nitrate solution, ½ to 2 per cent., injected once weekly.

Mr. Leedham-Green (Birmingham) was of opinion that the only cure was removal of the diseased organ. But he was doubtful if early tuberculous infection did not sometimes heal spontaneously, as it did in other parts. So long as the function of the kidney was unimpaired he would not remove it. Clinically it was difficult to estimate the stage of the disease. In children their attitude should be one of extreme caution because in them he had found tuberculous bacilluria with few pus cells or none and good functionating kidneys.

Dr. David Newman (Glasgow) demonstrated by the projectoscope the cystoscopic appearances in early renal and vesical tuberculosis. He pointed out that the most characteristic feature of the symptoms (polyuria, slight pyuria and albuminuria, occasional hematuria) was their tendency to remission, and in that lay a serious danger in so far as both patient and doctor were deceived. The premonitory symptoms of tuberculosis could appear long before the development of a gross renal lesion. In this stage cystoscopy frequently applied, and harmless as it was, was most successfully employed. When a kidney was tuberculous the orifice of the corresponding ureter indicated the nature of the lesion by changes in

the color and contour of the lips of the orifice, by the size, frequency and regularity of the "shoots" of urine and by the character of the urine which escaped. His conclusions in primary renal tuberculosis were: 1. When the ureteral orifice was normal no serious disease existed in corresponding kidney. 2. When the kidney was normal the orifice of the ureter also was normal. 3. Evidence of tuberculosis at orifice was associated with tuberculosis of corresponding kidney. 4. In tuberculosis of bladder the ureter did not become involved if corresponding kidney were free from disease.

Professor Rovsing (Copenhagen) was doubtful of the possibilities of early diagnosis, and thought that these very early cases rarely came to the surgeon. After removal of the tuberculous kidney, the tuberculous bladder quickly recovered; to assist it he injects 6 per cent. carbolic acid. The efficacy of tuberculin seemed to him so problematical that its use should be limited to inoperable cases.

Mr. Hurry Fenwick (London) held that early cases of kidney mischief were diagnosable by the cystoscope. Even only three weeks after onset of symptoms he had found thickened ureter and intravesical signs. He had used tuberculin constantly for fifteen years in small doses and found that the patient's general condition improved nearly always. He believed it acted as a tonic. Our knowledge of this disease was to come from study of its progress in the female patient. Nephrectomy was a perfectly safe operation if performed with rigorous asepsis; the mortality need not be over 3 per cent.

Surgery of the Arteries

The chief subject for discussion Saturday, August 9, was "The Surgery of the Arterial System." Prof. Rudolph Matas, New Orleans, made a rapid survey of the whole range of the new movement in surgery, described the suture of both arteries and veins, arteriovenous anastomosis of various kinds, transplantation of arteries and veins and brought forward laboratory as well as clinical evidence to show the feasibility of these various procedures. In regard to vascular implantation of arteries and veins autogenetic methods were more suitable than heterogenetic though these were not wanting in success. The segment of an artery or vein could be grafted to another, or branches of a parent trunk could be reimplanted on the same vessel at different levels. Arteries and veins could be patched with portions of blood-vessels or other material. The main portion of his paper was devoted to the method of treating aneurysm by suture associated with his name—intrasaccular suture or endo-aneurysmorrhaphy. The latest statistics included an analysis of 215 reported cases. The results fully justified the confidence placed in this operation.

Dr. C. A. Ballance recognized that surgery of blood-vessels had advanced greatly. He specially spoke of the obliterative and reconstructive treatment of aneurysms recommended by Matas and thought that since Hunter no advance had been made till Matas began his work. In his own view, except in the treatment of aneurysm of the aorta and some other great vessels, and in special circumstances, Matas' method was not likely to find general acceptance. He regarded popliteal aneurysm as the type best suited for Matas' operation. But nevertheless the practical advantages and the extreme simplicity of the Hunterian operation seemed to him still to prevail. He thought the Hunterian operation for popliteal aneurysm was the greatest advance in surgery ever made by the single act of one man. Matas' operation should be reserved for those cases in which the older operation is inapplicable.

Dr. A. L. Soresi of New York showed his apparatus for suture of blood-vessels. He had had made a small clamp which held the ends of the vessels to be joined in such a way that minute hooks held back a cuff so as to expose the intima all around. Then intima was sutured to intima by the insertion of very small gold wire clamps after the fashion of Michael's clamps. A single row of these was enough to effect a complete and safe junction.

Dr. Davis (Brussels) said that Professor Oppel of St. Petersburg had said that ligation of both artery and corresponding vein gave a better final circulation than ligature of the artery alone. The principle was sound but on one condition only, that the vein should be tied *after* the occlusion of the artery. He had proved the efficacy of the method and the truth of the principle by some experiments.

Dr. Ernest Jeger (Berlin) gave a short account of some of his studies. Eck's fistula or anastomosis between portal vein and inferior vena cava he had performed repeatedly on dogs. Magnesium tubes were a useful support to blood-vessels in suturing, as the magnesium afterward became absorbed. He demonstrated specimens of transplanted kidneys from their normal situation to the neck, the carotid artery being joined to the renal artery and the jugular vein to the renal vein. He had even inserted one end of a piece of vein into the left ventricle of the heart and the other into the aorta, so that the aortic valve was put out of use. Most of these experiments were performed on animals, but he was hopeful that in time they will become applicable to the human subject.

The experience of Dr. V. Soubbotitch with traumatic aneurysms in the Balkan War was interesting. The majority of the cases had to be treated by the older methods, but in some cases he and his colleagues were able to suture arteries and veins with moderately good results.

Dr. Chiasserini (Rome) had performed thirteen experiments in transplanting flaps of fascia lata in repairing the aorta or other large vessels with such success that he recommended that tissue as very suitable for the purpose.

Discussion on Brain Tumors

The largest and most representative meeting of the Section was that which met Monday, August 11, for the discussion on "The Diagnosis and Treatment of Tumors of the Brain." The essayists were Professor von Bruns, Professor Freiherr von Eiselsberg and Dr. H. H. Tooth.

Professor von Bruns showed that operative procedures for cerebral tumors fell into two groups: (a) radical operations with extirpation of the tumor, (b) palliative operations for the relief of pressure, and these could be either primary and devised for that purpose alone, or they were performed as a scondary resort when the radical operation for some reason could not be performed.

The indications for the radical operations and the prognosis of those operations depended on three things: (a) the nature of the tumor; (b) the possibility of certain general and local diagnosis; (c) the accessibility of the tumor. Inaccessible were tumors of the third ventricle and many in the substance of the hemisphere. All others were accessible, but with very different degrees of danger.

Professor von Eiselsberg spoke of the great difficulties in operating on tumors of the hypophysis. He had tried to attack these tumors by the nasal route, but thought the risk of operating through a passage not absolutely aseptic was great. He showed several specimens and pictures of cases operated on. He strongly advocated early operation and held that it was inhuman not to operate on brain tumors.

Dr. Howard H. Tooth's report concerned itself with the question of results of surgical treatment. A high mortality was inevitable at the best. They were not to be dismayed by it nor relax efforts to relieve patients. In frontal tumors where removal of tumor partial or complete was done he found that in glioma the average postoperative survival period was ten months; in endotheliomas which pressed on but did not infiltrate the brain and which could be removed without great difficulty the mortality was 46.6 per cent. In tumors of the central region comprising 65 cases of glioma, sarcoma and carcinoma, the average postoperative survival period was ten months. The percentage of recoveries in endotheliomas was 66.6. There were only a few cerebellar cases, with four recoveries. Two tuberculoma patients died within two months though the growth was completely removed. Decompression by craniectomy in one or two stages was followed by an appreciable lowering of pressure. From his tables he could draw no conclusion for or against the method.

Prof. Harvey Cushing said that the relief obtained after decompression in a relatively silent area might be great. Many tumors were slow in growth and might reach a large size before disturbance took place. If a very strict interpretation of the recovery was taken, none would see more than 5 per cent. recoveries. But if the patient obtained after the operation freedom from discomforts, preservation of vision, prolongation of life, then the percentage of recoveries rose to 50 or 60. There could be no doubt that 10 per cent. would succumb after operation, even after such a simple proceeding as decompression. In the last 100 consecutive cases he found that seven deaths could be attributed to the operation. In 350 tumor cases need for operation was certified in 200; 40 per cent. were gliomas, 30 per cent. arose from glandular structures. In true endotheliomas there was none of the cellular fibrillae seen in gliomas; they were potato-like tumors which had point of origin from the dura. Two cases of enormous tumors had no pressure symptoms and no ocular fundi changes. He had had twenty-four operations for tumors in the lateral recess of the cerebellum. To reach

that area he strongly advocated the large crossbow incision with, if necessary, removal of posterior half of foramen magnum. This permits exposure of the medulla, and if respiratory difficulties arose he had removed the posterior portion of the atlas while artificial respiration was being carried on with restoration of respiration.

He thought they must operate slowly in these cases with complete hemostasis. His operations sometimes lasted four hours and they often had to be done in three or four stages. Extremely delicate manipulation was necessary with the greatest possible respect for brain tissue.

Sir Victor Horsley thought accurate histologic diagnosis of tumors was most important. Earlier diagnosis meant earlier operation. He blamed the writers of text-books for their too rigid insistence on recognition of the three great classical signs, headache, vomiting and optic neuritis. These appeared late. They were end-results and the patient ought never to have reached the stage when these appeared; often by that time the tumor was irremovable and decompression only was feasible. Optic neuritis was a most valuable sign. He agreed with von Bruns in recognizing the difference between a radical and a palliative operation and held that operation might be done for differential diagnosis. In palliative operations he deprecated opening the dura, as a rule.

Professor Krause (Berlin) had operated by local anesthesia. He showed pictures of angioma of the brain, and endothelioma growing from the dura. Professor Claude (Paris) was strongly in favor of decompression to relieve symptoms. Sir William MacEwen said that the principal factors in his experience were the necessity for early diagnosis and localization. Wherever physiologists made certain of special points which bore on localization surgeons were able to go in at the part and remove the tumor. Early diagnosis and early operation went together. The classical symptoms were stated too positively, for sometimes a tumor was present even in the absence of classical symptoms. He had found a large tumor and removed it successfully where the only signs were slight paresis of the right arm and contraction of left pupil. In the motor area localization was definite and complete, but in other regions it was not so. Word-blindness, mind-blindness and word-deafness were symptoms which ought to be localizing symptoms and he had successfully operated where these symptoms were present. He had no great belief in statistics.

Professor L. M. Poussepp (St. Petersburg) had operated on thirty-one patients with brain tumor; sixteen cerebellar and fifteen cerebral. His general opinion was that success was not so much a matter of surgical technic as of precision in diagnosis, which could only be obtained by continued study of surgical neuropathology.

Dr. Byrom Bramwell (Edinburgh) thought that there were very few cases of intracranial tumor which could be completely and successfully removed by the surgeon. The whole matter turned on what they meant by recovery. If the tumor were removed and the patient left hemiplegic or blind he had not recovered at all. His pathologic experience convinced him years ago that the surgeon could do little or nothing and he had not seen reason to change from that opinion. He was, however, greatly impressed by the value of the right-sided decompression operation.

Discussion on Intrathoracic Surgery

Tuesday, August 12, Professor Sauerbruch reported on the "Present State of Intrathoracic Surgery." The factors which had been of most importance in the development of surgery of the chest, were, in the main, three: The improvement of diagnosis by means of Roentgen rays; by this method changes in the lung substance, the formation of cavities, the presence of tumor, and the stages of tuberculous disease could be demonstrated, and the alterations and improvements following treatment could be traced. He placed next the experimental researches on pneumothorax. The last factor was the introduction of methods to determine the difference of pressure within the lung in relation to atmospheric pressure.

His own experience was that operations on lungs were best performed by the aid of special apparatus to establish a negative pressure, that is, that the operator and the whole of the patient, except his head, were in a chamber whose pressure was less than the atmospheric pressure, so that collapse of lung did not occur when the pleural cavity was opened. The same object was attained in the reverse manner by making the patient breathe in a small chamber whose internal pressure was higher than atmospheric pressure; this was known as positive pressure. By these methods exploratory opening of the chest cavity was as simple an operation as exploratory opening of the abdominal cavity, and tumors could be removed.

Bronchiectasis was treated by opening into the lung cavity, and drainage. He had cut the phrenic nerve, and performed artificial pneumothorax for the purpose of putting the affected lung at rest. In tuberculous disease of lung he had performed Freund's operation of cutting the costal cartilages of some ribs to permit immobilization of the lung, and had also endeavored to bring about the same object by artificial pneumothorax, thereby causing collapse of the lung. He gave statistics of his work.

In Zurich hospitals in 1910-1913 he had operated on eighty-three cases of lung disease.

Professor Tuffier's report was read in his absence by Dr. Caillard. The ground was similar to that by Professor Sauerbruch.

Sir William MacEwen demonstrated a patient operated on by him eighteen years ago, whose left lung had been removed in its entirety for tuberculous disease. The patient was a strong, healthy-looking man whose left side was hollow and fallen in. He was engaged steadily at work. At the time of the operation the right lung was diseased, but the removal of the hopelessly diseased lung was followed by improvement in the condition of the remaining lung. That experience had been found in four similar cases. In all these cases the apex of the diseased lung had been adherent to the great vein at the root of the neck, and at a later stage in the last four cases the vein and that piece of lung were removed.

Sir William MacEwen's second point was with regard to the differential pressure theories and apparatus of Sauerbruch and others. His belief was opposed to theirs that all these elaborate apparatus were necessary. It was not atmospheric pressure which held together the two surfaces of the pleura, the lung surface and the inner lining of the chest wall. He attempted to demonstrate this by suitable apparatus. He had consulted the late Lord Kelvin, and he had recognized that it was a much greater force, which he suggested should be called "molecular cohesion." Professor MacEwen proved to the Section by an experiment on the table that atmospheric pressure did not hold together two pieces of glass of uniform smooth surface. He believed that the pleural surfaces were held together by molecular cohesion, and that so long as the opening in the pleural cavity was patent to the atmosphere the collapse of the whole lung will not take place. In regard to cancer of the lung, he had given patients great relief by opening into the lung cavity, clearing out the pus and broken-down lung substance and allowing the cavity to close by granulations. He had not cured the cancer, but the patient's death was easier.

Mr. Morriston Davies (London) had performed artificial pneumothorax for phthisis by collapsing the lung and also immobilization of the ribs for the purpose of keeping the lung at rest in phthisis. He advocated strongly frequent and repeated radioscopic examination.

Dr. Meltzer and Dr. Charles Elsberg of New York, Mr. G. E. Gask of London and Dr. Davis of Brussels all demonstrated methods of anesthesia to be employed in operations on the lungs. All except the last were for purposes of intratracheal insufflation. Dr. Meltzer was the pioneer in this form of anesthesia.

Section on Diseases of Children

The President, Dr. Eustace Smith, opened the work of the section Thursday, August 7, by a short address. After extending a welcome to the visitors he referred to the very special character of diseases as they occurred in children, and traced the growth of pediatrics as a special subject. He concluded by expressing a hope that the new methods which had been introduced would not lead to a neglect of those older methods which had already proved useful.

The special discussion of the day was introduced by Dr. V. Ménard of Berck-sur-Mer and dealt with the "Treatment of Tuberculosis in Childhood from the Surgical Point of View," with special reference to bones, joints and lymph-nodes. He thought from the standpoint of local treatment tuberculous osteitis should be separated from tuberculous disease affecting the bones and joints. The local treatment indicated in arthritis was the conservative method, which was almost always efficient if persevered in. Surgical interference was required in suppuration; as the result of associated accidental infections when the disease affected particular joints. Such an operation was drainage or a form of resection which was really drainage on a large scale. The fatality of operative procedure

was very small except in the case of hip-joint disease, but here it formed no contra-indication, for it was necessary to save life. The results of operation were good if the after-care was rational and persevering. In spite of the improvement of medical treatment in disease of the lymph-nodes there still remained a part for surgery to play in this condition to free the patient quickly from large masses of lymph-nodes. Whether operated on or not the patient could only recover if placed under favorable conditions for a long time.

Mr. Harold J. Stiles (Edinburgh) continuing the discussion spoke especially of prophylactic treatment and referred to recent work in Edinburgh in this direction. He thought that Koch and his disciples committed a serious error when they minimized the importance of milk as a source of infection in children. Mr. John Fraser had undertaken a research as regards bone and joint cases in the laboratory of the Royal College of Physicians of Edinburgh. His results were of extreme significance. Of the seventy cases investigated, thirty were cases of joint disease and thirty-one of bone disease. Of the seventy cases the bovine bacillus was present in forty-one, the human bacillus in twenty-six and both types in three. All the patients but three were under 12 years of age. It was interesting that in each of the three adults the bacillus was of the human type. Forty-one of the children were under 4 years of age, and in these, in no less than 78 per cent., the disease was due to the bovine bacillus. This bacillus was the organism found in all the children less than 12 months old, and each of these had been entirely nourished on cows' milk. In none of the children artificially fed had the milk been sterilized. Dr. A. P. Mitchell had worked on the etiology of tuberculous diseases of the cervical lymph-nodes. He had investigated seventy-two consecutive cases of lymph-nodes operated on at the Royal Edinburgh Hospital for Sick Children. In nearly all the cases the disease involved the upper carotid set of deep cervical lymph-nodes. Of the seventy-two cases it was found that sixty-five, or 90 per cent., contained the bovine bacillus, and only seven, or 10 per cent., the human form. Thirty-eight occurred in children under 5 years of age. Of these all but three were bovine. Out of sixty-five children infected with the bovine bacillus there was not a single case in which a history of pulmonary tuberculosis could be obtained in the family. There were only three instances in which a history of pulmonary tuberculosis could be obtained in the parents, and in each of these three it was the human form of bacillus which was isolated from the cervical lymph-nodes. Dr. Mitchell's investigations revealed a much larger percentage (practically a third of the cases) of primary tuberculosis of the tonsil than had hitherto been recorded. It was to be hoped that as the result of these investigations the medical profession would realize its responsibility and by educating public opinion bring pressure to bear on the government and the public health authorities to take effective measures to stamp out bovine tuberculosis among dairy cows. He (Dr. Stiles) thought that tuberculosis of the lungs in adults was usually the result of infection through the respiratory tract, while in children tuberculous infection was usually through the alimentary tract. It was very important that the milk should be sterilized which was used for the artificial feeding of infants unless it could be guaranteed free from tubercle bacilli, and that sterilization should be employed also in all households where the children drink milk.

Among those who took part in the discussion which followed were Prof. von Pirquet, Professor Tedeschi, Dr. Andrieux, Dr. Comby, Dr. d'Oelsnitz, Dr. Treplin, Dr. Binney, Dr. Koplik and Dr. Nordheim.

In the afternoon Dr. David B. Lees (London) dealt with the diagnosis of early pulmonary tuberculosis in children. He emphasized the virtue of careful methods of percussion, pointing out that such examination was all the more important in children, since as a rule, no sputum was obtainable.

Dr. P. von Pee of Verviers spoke of the value of "orthopercussion" as described by Goldscheider and by Curschmann and Schlager. It was based on the following principles: (1) the percussion should be as gentle as possible so that the sound could only just be heard; (2) as small an area as possible should be percussed, by application to the chest, not of the terminal phalanx, but by the end of the finger placed vertically in the position of Plesch; (3) percussion should be made with the pleximeter finger parallel with the midline of the body. He examined symmetrically the following regions: (a) the area between the two sites or insertion of the sternomastoid muscle; (b) the subclavicular triangle; (c) the area outside the subclavicular region; (d) the area of the manubrium sterni and the sternoclavicular articulation. The diagnosis of pulmonary tuberculosis in the newly-born was always difficult, and as it had been shown that the tuberculin tests gave a positive result more frequently as age advanced, the difficulty became worse. Seeing the frequency of a positive reaction to the bacterial test it was important to give to ordinary clinical methods the credit which was their due.

Dr. d'Oelsnitz (Nice) spoke of the diagnosis of disease of the thorax by means of radiography. In the discussion which followed these papers Dr. Lapage supported Dr. Lee's contention as to the value of Roentgen rays in the early diagnosis of tuberculosis in children. He thought that the earliest signs were to be found at the roots and not at the apices.

Dr. Findlay (Glasgow) read a paper on the portal of entry of tubercle bacilli. He had by means of special technic been able to inject bacilli into the stomach without insufflating the lungs. The difficulty in avoiding this latter had rendered much former work valueless. The results of his experiments went to show that infection did not occur through the intestine in the absence of a local lesion.

Dr. Coit, Newark (U. S. A.) in a paper dealing with the viability of children deprived of women's milk during the first year of life, spoke of the need of some method of estimating the value of sufficient means of saving infant life at this period. Collaboration between scientific workers and social or philanthropic workers was necessary. He exhibited "score cards" which he had found useful as indicators of the value of philanthropic and other measures.

Discussion on the Ductless Glands

Saturday, August 9, Mr. Hastings Gilford (Reading) read a paper on "The Influence of the Ductless Glands on Development." He said that to one who attempted to assimilate the information on the ductless glands which had been collected by Sajous, Swale Vincent, Biedl or by Cushing, or who went to the sources of their supply, could not but be struck by the growing importance of the subject. At the same time it became evident that this information could not, as yet, be brought to a focus. Information as to the uses of the ductless glands must still be gathered mainly from clinical, surgical and post-mortem study. The subject was one of correlation, not so much of correlation itself as of the excitement or depression of correlation. In all probability it was the mere mechanical penetration of the germ cell by the sperm cell which was the stimulus for the first correlation in all vertebrates, the fusion of sperm with germ afterward supplying that blend of characters which constituted complete fertilization. Next there came a period of development in which as yet there were no ductless glands, when, as in plants, the necessary stimulus to correlation was both simple and direct. For a time there must exist in the primitive embryo some simple secretive mechanism which later on would be gradually segregated into organs and become ductless glands, devoted to the production of hormones to excite and harmonize the action of widely separated organs. It might be suggested that this primitive faculty of cells was never lost and that in after life the ductless glands did not monopolize the power of chemical stimuli to correlation, but that all tissues possessed some degree of the same property. It might be in some such way as this that local correlations could be explained. Thus, when a segment of a long bone was destroyed in infancy the growth of muscle, fat, vessels, nerves and skin did not continue as on the sound limb. On the contrary, a considerable degree of adjustment took place. Such correlation was not solely the outcome of disuse, for a similar process was at work in the limbs of the rickety and the achondroplastic. Local adjustments of this sort varied greatly in their completeness. It was true that achondroplasia was one of the disorders which had been attributed to deficiencies of pituitary secretion, but on the other hand, the locality and nature of the changes seemed to point to the skeleton as the prime seat of the disease. Another disorder which appeared to point to correlating influences apart from ductless glands was mucrocephaly. He said that the object which he had before him was to emphasize the doctrine just brought forward by Bernard, that although the ductless glands served an important purpose in the correlations of the body, they were only a part of the machinery of adjustment. For rapid adjustments, the nervous system came into play, and for slower adjustments one had to consider not only the ductless glands, but also that primitive capacity for adjustment which was inherent in the tissues of all parts of the body.

Speaking of the disorders of the ductless glands he said that out of the fog which at present obscured the subject

a few clinical types of disease, the outcome of pathologic changes in the ductless glands, were gradually emerging. They were as yet very ill defined owing partly to overlapping of their symptoms, partly to the variability of the effects produced by similar lesions and possibly partly to the influence of such other factors as he had just referred to. Yet there was some hope that we were on the right track for the solution of the problem. It was right that we should coordinate our knowledge and formulate our theories, even though we were conscious that book knowledge and theories were fallacious.

He then considered abnormalities of the function of the thyroid gland, pointing out that though myxedema was regarded as hypothyroidism and Graves' disease as hyperthyroidism, the one was by no means an antithesis of the other. Speaking of the lymphatic system, he said that when lymphatic structures were overgrown the condition known as lymphatism was present. An infant in such a state, in its most characteristic form, was fat, pale and stolid, though the intake of food might be under the average. Lymphatic tissue apparently inhibited to some degree the action of the thyroid, the pars anterior of the pituitary gland and the sex organs. Destruction of the large tracts of the lymph system, as in Hodgkin's disease, gave rise to a syndrome in which emaciation and debility were conspicuous.

Speaking of the sexual system, he stated that all attempts to influence growth and development by extracts from the sex glands had failed. We were not in a position to conclude that the series of changes which took place at puberty were solely the result of the pouring out of secretion from the sex glands, nor were we justified in assuming that the changes at the menopause were solely due to its withdrawal. He afterward dealt with the pituitary system, stating that among the disorders attributed to defective action of the hypophysis were ateliosis and progeria.

He also considered the sexual group of diseases and those of the suprarenal system. He concluded by saying that for the answer to the question as to the causes of the defective or the excessive action of any ductless gland, one must go to genetics. This branch of biology showed that as there was a normal size and a normal action, so also was it as inevitable as light to darkness that size and function must occasionally become abnormal and fall into extremes. By studying these extremes, one arrived at some sort of conclusion, however hazy, as to the normal action of the ductless glands. In the harmony which is provided by the concerted action of the ductless glands there was reason to suppose that the leading part was played by the thyroid. This supplied a stimulus for the metabolism of the body as a whole. During infancy and childhood the influence of the thyroid was checked by the thymus gland, by the lymphatic system and perhaps by the pineal gland. These also brought about that delay of sexual activity which was so essential to the proper maturation and stability of the somatic faculties. Probably the first to break through this cordon of conservative influences were the adrenal glands, which awakened the dormant sexual organs and hastened the growth of the muscular and skeletal systems. At about the same time the skeletal system was still further stimulated by secretions from the pituitary gland. This secretion hastened the development of every organ in the body, including the sex organs. These latter now ripened apace, and assisted by the combined action of the ductless glands, sometimes animating, at others restraining, carried the development of the body in waves and tides to its flood.

Dr. d'Oelsnitz (Nice) contributed a paper on "Chronic Suprarenal Inadequacy in Infants." In the discussion which followed, Dr. Koplik (New York) said that he had been impressed by the associated disturbances of the viscera generally in abnormalities of the ductless glands. In the case of children the intestine was almost invariably disordered.

Prof. Swale Vincent thought that much more was being taught about internal secretion than was really known. The difficulties were enormous. Extirpation of the thyroid never produced myxedema. The pathology of myxedema or cretinism was something more than merely thyroid insufficiency.

Dr. Leonard Guthrie said that there was a distinction to be drawn between the obesity of Fröhlich's syndrome and that of hypernephroma. In the former the appearance was that of infantilism, in the latter that of fat adults.

A paper was also contributed by Dr. Fischer of New York on the treatment of septic cases of scarlet fever by neosalvarsan. He had treated ten apparently hopeless cases in this way, of which three recovered. He thought it was worthy of trial in cases in which nothing else could be done.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Albany Medical Annals

August, XXXIV, No. 8, pp. 445-508

1 Present Status of Renal Functional Tests with Special Reference to Phenolsulphonephthalein. N. K. From and J. F. Southwell.
2 Acute Thyroiditis as a Complication of Acute Tonsillitis.
3 First Report of the Medical Inspector of Schools to the Board of Education. C. P. McCord.

American Journal of Diseases of Children, Chicago

August, VI, No. 2, pp. 65-144

4 *Pancreatic Insufficiency. L. Porter, San Francisco.
5 *Status Thymolymphaticus. W. L. Bierring, J. A. Goodrich C. F. Theisen and D. Glomset, Des Moines, Iowa.
6 Needle in Heart Fifteen Months; Death; Autopsy. W. P. Northrup, New York.
7 Diagnosis of Intussusception by Roentgenoscopy; Report of Case. I. M. Snow and M. Clinton, Buffalo, N. Y.
8 *Mucous Cyst of Cecum in Infant Ten Weeks Old, Producing Obstruction of Ileocecal Valve and Symptoms Simulating Intussusception. A. D. Blackader, Montreal.
9 *Cardiac Disease in Childhood, with Special Reference to Prognosis. C. H. Dunn, Boston.
10 *Diagnosis and Treatment of Pyelitis in Infancy. R. G. Freeman, New York.
11 *Analysis of One Thousand Cases of Epidemic Measles. C. V. Craster, Rosebank, N. Y.

4. **Pancreatic Insufficiency.**—From a clinical and bacteriologic study of three cases, Porter concludes that in the group of cases characterized by waste of most of the ingested fat, with or without loss of the ingested starches and proteins, we are probably dealing with a bacterial invasion of the pancreas secondary to the presence of an abnormal bacterial flora in the small intestine. To Porter the question of the value of vaccines in such a condition is brought up because in one case the results following the use of a vaccine were so striking that it seemed impossible that mere coincidence will explain them. It is not suggested that one certain organism is specific for this condition, although Porter regards it as quite reasonable that any pathogenic bacterium, or even the colon bacillus, under abnormal intestinal conditions, may become the inciter of a pancreatitis which may lead to a suppression or deficiency in one or the other of the pancreatic ferments.

5. **Status Thymolymphaticus.**—The four cases studied by the authors presented the same symptom-complex: pasty complexion, a flabby fat overgrowth, hypertrophied tonsils and adenoids, enlarged cervical, axillary, and inguinal lymph-nodes and signs of an enlarged thymus; all were bottle-fed and had the "pot belly" of the rachitic. Three of the four had a preliminary deafness. Three of the four had seizures of choking or attacks suggesting thymic asthma. All were apparently well nourished. In all no malady sufficient to cause death was noted clinically. In all cases death occurred before the arrival of a physician and under very similar circumstances. No other similar cases are known among the playmates or friends. All were of nervous temperament and became easily excited. One child had diphtheria in 1911 and was given 5,000 units of antitoxin, the other three children receiving at the same time 1,000 units each for prophylactic purposes. The post-mortem findings were practically identical in the four cases: the lymphoid hyperplasia and enlarged thymus prevailed in each. The weight of the thymi were, respectively, 42, 54, 25 and 40 gm. The histologic changes found in all of the cases are extremely suggestive of a chronic inflammation affecting principally the lymphatic tissues. Whether this chronic inflammatory reaction has been produced by poisonous substances formed in some other part of the body or eliminated by some unknown micro-organism affecting the lymphatic tissues, is difficult to say. The authors find it difficult to conceive that the enlargement of the thymus was the main causative factor in the deaths of the children.

8. **Mucous Cyst of Cecum.**—A child, aged 10 weeks, was first seen for continued vomiting. The infant had been nursed by its mother and had thriven well for the first two months of life. Then it began to vomit after taking nourishment. The physician who first saw it regarded the mother's milk as the cause of the trouble and advised artificial feeding. This was tried without benefit; the vomiting persisted and the nutrition failed rapidly. There was no pyrexia. The consultant recognized a sausage-shaped tumor in the lower right quadrant of the abdomen, 3 inches long by about 1 inch in diameter, freely movable, not tender; no muscular rigidity of abdominal walls. Distinct peristaltic waves were noticed traveling toward the site of the tumor. Shortly after entrance into the ward a high enema was given which brought away no flatus, and only a small amount of feces, in which there was no appearance of blood or much mucus. Following this the abdomen was immediately opened under spinal anesthesia. The oblong tumor mass was found to involve the lower portion of the ileum and cecum; above the mass the ileum was much distended, while below it the ascending colon was collapsed. Regarding it at first as an ileocecal intussusception, careful efforts were made at reduction, and when they failed, a resection was performed with end to end anastomosis, and the abdomen closed. On examination afterward of the incised mass its true nature was disclosed. Death occurred from peritonitis.

The pathologic report on the specimens removed at operation was as follows: "The tumor consists of the lower portion of the cecum with its contained cyst, and the appendix. The cyst, much collapsed, measures about 2 cm. in diameter, is unilocular, contains glairy mucoid material and is situated on the wall of the cecum opposite the ileocecal valve, extending over to and completely obstructing that orifice." Microscopic examination of the cyst walls showed the surface of the tumor projecting into the lumen of the cecum to be covered with mucous membrane similar to that of the intestine; the cyst to be lined with a somewhat stretched layer of columnar epithelium which, however, in some places was folded into gland formations. Beneath each surface of epithelium was a submucosa infiltrated with lymphocytes, and between these again are three more or less distinct layers of muscle. From this report the cyst was regarded as in all probability a retention cyst, arising either from some fault in development or from an inflammatory occlusion of the mouth of the original gland.

9. **Cardiac Disease in Childhood.**—The series of cases included in Dunn's investigation numbers 304 cases of cardiac disease. It throws a certain amount of light on the relative frequency of occurrence of the various etiologic factors. Rheumatic fever, 264 cases, 87 per cent.; congenital lesions, 21 cases, 7 per cent.; some recognized infection other than rheumatic fever, 9 cases, 3 per cent.; unknown etiology, 10 cases, 3 per cent. Acute infection, 206 cases, 78 per cent.; chronic endocarditis, 58 cases, 22 per cent.

Dunn points out that rheumatic fever is very much the commonest cause of cardiac disease in childhood. Cases with acute rheumatic infection localized in the heart are much commoner than patients suffering from chronic endocarditis.

Cardiac symptoms are due to two causes: first, acute infection localized in the heart; second, broken cardiac compensation. Of these two causes the first is the commoner. The liability of children to recurrent attacks of acute rheumatic infection, in any of which the heart may be involved, is very great. The immediate mortality of rheumatic cardiac disease is about 20 per cent. The subsequent mortality of patients with endocarditis of rheumatic origin, followed for at least ten years, is about 50 per cent. The final mortality of rheumatic fever followed for at least ten years is 60 per cent. The mortality is seen chiefly during childhood. The mortality after young adult life is reached falls to only 7 per cent.

The cause of death is heart failure. The cause of the heart failure may be either acute cardiac infection or broken compensation. In childhood the former cause is far the more common. After adult life is reached the latter cause is more common. The particular valvular lesion present has little or no relation either to the mortality or the amount of disability in adult life; except that aortic disease appears to be a particularly fatal lesion in childhood. The causes of the great mortality of rheumatic fever in children are: first, their greater liability to this infection; second, their greater liability to recurrent attacks; third, their greater liability to cardiac involvement. Patients who escape the dangers of childhood, and who enter adult life, are apt to show a remarkable freedom from disability. The majority of such patients can lead normal active lives. The probable cause of this freedom from disability lies in the fact that the cardiac damage occurs during the period of growth, and during this period a particularly perfect adaptation can take place between the heart and the patient, which enables the heart to meet the demands made on it. This adaptation is more perfect than can be attained in the adult. The earlier in life the cardiac lesion is acquired, the better is apt to be the result in adult life, as concerns ability to lead an active, normal existence; provided that the patient escapes the dangers of childhood. Treatment should be directed toward favoring the adaptation of child and heart. While guarding against overstrain, we must avoid too great limiting of the normal activities of childhood. In congenital cardiac disease, open ductus arteriosus is a favorable lesion.

10. **Diagnosis and Treatment of Pyelitis in Infancy.**—Pyelitis in infancy, due to the invasion of the pelvis of the kidney with colon bacteria resulting in a purulent inflammation, Freeman believes, can apparently occur with no perceptible rise of temperature at any time. These cases should be treated and cured by the means ordinarily used in pyelitis. The alkaline treatment of pyelitis, while it is safe and will control many cases, is markedly less efficient than other methods of treatment. Vaccines, either autogenous or commercial, are useful in controlling the constitutional symptoms of pyelitis. Hexamethylenamin, while sometimes effective in doses of from ½ to 2 grains several times a day, will not in these doses cure certain cases which may be controlled by very large doses.

Freeman urges that hexamethylenamin should always be administered in small doses first, but the dose should be rapidly run up, the child and its urine being carefully watched for symptoms of irritation of the kidneys.

Large doses of hexamethylenamin should not usually be continued for more than a week at a time; and then after several days without any treatment or with alkaline treatment it should be started at the maximum dose given before and the amount increased daily until an influence on the urine is obtained. Doses of 25 grains daily in a child of 6 months, and from 35 to 45 grains a day in a child from 9 to 12 months may be safely given in this way to some infants.

11. **Epidemic Measles.**—Of the 1,000 cases of measles studied by Craster the greatest number were in the month of June (186). The third year age period shows the greatest incidence of attack (195). The largest complication percentage, 81.3, and case mortality, 34.3 per cent., are found in the first year period. The seasonal prevalence of complication was highest in December, 78.6 per cent., and of case mortality in January, 25.2 per cent. The most frequent complication was otitis media, 495. The most common cause of death, bronchopneumonia and enteritis, 23.3 per cent. of total deaths. Average duration of the fever, four days. The onset of purulent otitis media on tenth or twelfth day may not be attended by unusual fever. If the temperature remains high after the fourth day, a possible grave complication is imminent. An initial high temperature does not necessarily point to a possible severe attack.

American Journal of Medical Sciences, Philadelphia

August, CXLVI, No. 2, pp. 157-312

12 Experiences in Twelve Cases with Steinmann's Nail-Extension Method in Fractures of Femur. J. C. A. Gerster, New York.

13 Relations of Internal Secretion to Mental Conditions. L. V. F. Hochwart, Vienna.

14 *Experimental Study of Sodium Bicarbonate and Other Allied Salts in Shock. M. G. Seelig, J. Tierney and F. Rodenbaugh, St. Louis.

15 *Pinching Appendix in Diagnosis of Chronic Appendicitis. A. Bassler, New York.
16 *Effects of Continuous Administration of Hypophysis Extract. J. H. Musser, Philadelphia.
17 *Tuberculin Therapy in Surgical Tuberculosis, with Correct Dosage Accurately Determined by Cutaneous Reaction. B. Z. Cashman, Lafayette, Ind.
18 *Influence on Gastric Secretion of Aseptic Foreign Bodies in Gall-Bladder. O. H. P. Pepper, Philadelphia.
19 Congenital Bilateral Fistulas of Lower Lip. L. M. Kahn, New York.
20 *Etiology of Pernicious Anemia. J. T. Pilcher, Brooklyn.
21 Rôle of Hydrotherapy in Treatment of Pellagra. G. M. Niles, Atlanta, Ga.
22 Analogies of Pellagra and the Mosquito. S. R. Roberts, Atlanta, Ga.
23 *Intensive Study of Epidemiology of Pellagra. J. F. Siler and O. E. Garrison, New York.

14. **Sodium Bicarbonate.**—Every infusion of sodium bicarbonate made by the authors caused a pronounced rise of blood-pressure following immediately on the start of the injection and being well sustained for varying periods. Hand in hand with the rise of pressure went an increase of amplitude of heart beat. This increase varied quantitatively as did the rise of pressure itself, its chief characteristic being its constancy. Not infrequently the amplitude of beat was doubled immediately after the injection of the bicarbonate, and the increased amplitude often persisted for half an hour or longer after the injection of the solution. In all of their fifty experiments with sodium bicarbonate they could not determine any effect on the rate of heart beat. When the bicarbonate was administered before shock was induced the rate of beat was not quickened, and when it was administered during the period of rapid heart action incidental to shock the rate was not slowed. In addition to its influence on the cardiovascular apparatus the sodium bicarbonate infusions exerted a marked effect on the respiratory function. The rate of respiration was sometimes increased, sometimes slowed, and sometimes unaffected.

These variations did not seem to depend on idiosyncrasies in the different dogs, for they observed all in the same dog following different injections of the same amount of the drug. The notable fact was that the depth of respiration was increased. The rise of pressure following the injections was not due to mere bulk of fluid. In a number of experiments a distinct rise was noted after the introduction of from 2 to 5 c.c. of a normal solution of sodium bicarbonate. In shock there is said to be an escape of plasma from the blood-vessels into the tissues. It has even been suggested that shock is due to increased specific gravity of the blood. It is possible that the introduction of a hypertonic solution might accomplish this purpose and that the sodium bicarbonate infusions might have been effective on this basis.

That this assumption is not correct, however, the authors proved by the simple experiment of infusing shocked dogs with the hypertonic salt solution and with hypertonic basic sodium phosphate solutions, with practically no effect on the low blood-pressure. Neither could alkalinity alone explain the rise in pressure. Sodium carbonate, for example, which is a much more strongly alkaline salt than is sodium bicarbonate, invariably gave a pronouncedly less marked rise of pressure. The basic sodic phosphate in most of the experiments gave no rise of pressure (this basic salt is in reality only slightly alkaline), and when a rise did occur following its use the authors were unable to determine positively that this rise was not coincidental rather than a casual result. The various solutions of sodic hydrate never caused a rise. The tribasic sodic phosphate, which is a strongly alkaline salt, caused only slight rise, and this rise was immediately followed by a fall that in two instances ushered in death.

The authors conclude that the pressor effect of sodium bicarbonate does not depend solely on the alkalinity of this salt. This conclusion is important in its bearing on the possible relationship between shock and acidosis. The possible blood-pressure raising effect of carbon-dioxid gas supplied directly to the blood in shock was also tested out. By properly regulating the flow of gas they could administer it over an indefinite period of time, and although the administration stimulated the respiratory function most actively it did not influence the rate of heart beat, amplitude of pulse pressure, or height of blood-pressure. When the carbon-dioxid gas was administered before shock was instituted it had no influence in warding off the oncoming fall of pressure, and when administered during shock it likewise had no influence in restoring pressure toward a normal level. It would seem to be clearly established therefore both that the pressor effect of sodium bicarbonate does not reside in the carbon dioxid radical, and that shock itself cannot be referred to acapnia. The direct vasomotor effect of the sodium bicarbonate solution on the blood-vessels was not tested out.

15. **Diagnosis of Chronic Appendicitis.**—Bassler describes the method of pinching the appendix as follows: If the patient is not too stout the lower border of the cecum is percussed from Poupart's ligament upward. Fortunately the cecum is usually distended with gas and an accurate level of the cecum when the patient is on the back can be determined. After this is noted, percussion transversely across the cecum is made to obtain its outer and inner edge. The outer edge is always possible of being noted. In percussing for this it is necessary when on the outer edge that the percussion stroke be directed straight backward toward the lateral edge of the body, and when on the inner, directly backward toward the junction of the psoas and iliacus muscles, at that area these lines being more oblique than the outer edge of the rectus. With an estimation of about where the appendix would be as judged from the location of the lower end and sides of the cecum, pressure on the abdomen should be made at that point.

When the cecum cannot be mapped out by percussion or the subject is well developed, and even in all, the second plan is to note the position of the right edge of the rectus muscle on the umbilical-spine line maintaining the site with a finger. Having the patient rise to a sitting position helps in palpating for the rectus edge. Standing at the right and facing the patient (for right-handed individuals) the thumb is placed vertical on the abdomen, the tip of the thumb pointing to the ensiform, when it is slowly pressed backward into the abdomen, not inward, outward, up or down. When the thumb has been sunk about half-way down to the back of the abdominal cavity, it is swung to the right of the patient at a right angle to the downward pressure line. This pinches the appendix against the iliacus muscle and unyielding structures under and at the side of it, and usually elicits pain or tenderness. It is well, having done this in the mid-distance between the anterior superior spine and the umbilicus and not having obtained tenderness, to move the thumb down about ½ inch, performing it again, and so on downward until one has reached almost to the brim of the pelvis. The same procedure on the left side serves as a control. By means of this method of downward and then right lateral pressure it is possible to elicit tenderness in the average case of chronic appendicitis. When tenderness is obtained on transverse pressure to the left it may be a Lane's kink, and when below it may be a tender ovary instead of an appendix.

16. **Effects of Extract of Hypophysis.**—Eighteen individuals were given the dried extract of the whole pituitary gland without other medication by Musser. The following effects were noted: Blood-pressure: Seventeen showed a rise in systolic blood-pressure, the greatest rise being 28 mm. of mercury. Usually a corresponding rise in diastolic pressure occurred, though rarely it remained at the same height as before taking the extract or even became lower. Pulse rate: The changes in the pulse rate were inconstant; an increase was generally observed, though in two individuals the rate was decidedly decreased. Diuresis: Six individuals noted a diuretic effect. The extent, absence, or presence of this symptom could not be accurately determined. The urine showed no particular change except in one case. Glycosuria was never observed. Intestinal tract: Diarrhea developed in seven cases, and four, previously costive, had daily movements during the period of taking the drug.

Subjective symptoms: Four individuals were apparently much benefited by the rise in pressure and general stimulative

effect of the glandular extract on the unstriated muscle, and one person was benefited through the diuretic effect of the extract. In the remaining patients there was little effect noted except by those who developed the rather annoying diarrhea. Musser concludes therefore that prolonged administration of extracts of the pituitary gland exert a distinct pressor effect on the peripheral vascular apparatus, which persists for an appreciable time after discontinuation of the drug. This is apparently the only consistent effect following continued administration of the gland *per oram*; other results are variable and indefinite.

17. For description of this method which was introduced by White and Van Normal, see abstract, THE JOURNAL, Nov. 5, 1910, p. 1682.

18. **Influence of Foreign Bodies in Gall-Bladder.**—Experiments were undertaken by Pepper in the hope of finding some explanation for the gastric hyperacidity so frequently found clinically in association with cholelithiasis. Lichty's work on the same subject and covering the same ground appeared before the work was completed, thus rendering unnecessary their further prosecution. It seems worth while to Pepper, however, to report the results obtained in the first simple phase of the investigation, partly because they are not in general in accord with those of Lichty and partly because they control possible sources of error in his work. These are the use of the stomach-tube in feeding the animals, the administration of food at irregular intervals, and the brief postoperative period of observation. The essential feature of the experiment was to place in the gall-bladder with as little trauma as possible a more or less smooth sterile object, too large to enter the ducts, and after appropriate intervals to study the gastric secretion. The gastric analyses showed no changes as the result of the experimental procedure. In two animals the average acidity after operation was higher than before, while in the other two the reverse was true. In all the animals, both before and after operation, the averages for free hydrochloric acid lay between the figures 16 and 24.6.

20. **Etiology of Pernicious Anemia.**—Pilcher maintains that achlorhydria is merely a symptom denoting a marked degree of chronic gastritis. It is usually evoked through extra-gastric irritative factors which are in many instances capable of correction. There are, without exception, present in such stomachs great numbers of bacteria ordinarily considered pathogenic, among which streptococci are especially to be noted. Practically all recorded cases of authenticated pernicious anemia present the symptom of achlorhydria, and in his own series of thirty-four cases the presence of occult blood in the stomach extract. Thirty-four instances of pernicious anemia were noted in patients presenting the symptom of achlorhydria hemorrhagica gastrica. In a few of these cases the lack of hydrochloric acid and the presence of occult blood were known to be present at least one year before any blood-changes were to be noted. In others the phenomena of paresthesia were evidenced some time previous to blood impairment, and many had suffered for years from chronic gastro-intestinal complaints. Eighty per cent. of cases of pernicious anemia have increased temperature some time during the course of the disease.

Pure cultures of streptococci have been found by competent observers in the blood of patients with pernicious anemia who were running a fever. Bacterial hemolysins are known to produce anemia resembling the pernicious type, as are other toxic substances, among which may be classed the lipoid group. Efforts directed to the control of bacterial growth in the body and particularly in the gastro-intestinal tract have caused complete remissions in this disease in some instances. The phenomena of occurrence, remission and reoccurrence of the blood-picture characteristic of pernicious anemia may be explained by our present knowledge of the action of toxins from whatever source, impairing the formation of antibodies until a bacteremia is produced which may be clinically recognized. The toxins present being eliminated by the profuse flora in the gastro-intestinal tract, the impairment of bodily resistance is accomplished through their absorption and the disturbance of digestion in cases of achlorhydria.

Finally, reactive and combative ability of patients suffering with achlorhydria varies in different patients, and on this ground alone might be explained the relatively rare occurrence of pernicious anemia, although the occurrence of achlorhydia is fairly common. Thus the development of pernicious anemia would seem to be dependent on a personal idiosyncrasy of certain individuals; in fact, we must revert for the real etiologic factor of its inception to an embryonic tendency, the presence of which we are not as yet able to determine, until it has been stimulated into an active destructive agent of the blood by the toxins absorbed from the profuse bacterial flora present in the stomach.

23. **Epidemiology of Pellagra.**—The epidemiologic data presented in this report by Siler and Garrison are summarized as follows: 1. Pellagra shows a striking inequality of distribution in the ten townships within the county, the township rate of prevalence per 10,000 of population varying from 0 to 71. The city of Spartanburg, with a population of 17,517 gave a rate of 49 per 10,000 against 34 per 10,000 for the remainder of the county. Density of population while showing a tendency to conform to the relative prevalence of the disease does not alone offer an explanation of the geographic inequalities of its distribution within the county. The cotton-mill-village population gives a rate of prevalence of 104 per 10,000 against 19 per 10,000 for the remainder of the county, and against 16 per 10,000 for the rural sections alone. The variations in the rates of prevalence in the ten townships are in a measure proportional to the presence or absence of a large mill-village population. Excluding the mill-village population, there is still a marked discrepancy between the townships in the rural population alone, ranging from 0 to 29 cases per 10,000 of population. The excessive prevalence among the farming classes is found in the townships which have a relatively large mill-village population. The white population of the county gives a prevalence of 45 cases per 10,000; the negro population a prevalence of 9.5 per 10,000. Excluding the mill-village population which is practically all white, the remaining white population still gives a rate of prevalence (25.2 per 10,000) over two and a half times that among the negroes. The rate of prevalence per 10,000 for males in the county is 17; for females, 50.5. White males give a rate of 22.95 per 10,000; white females, 87.5 per 10,000; negro males, 3.9 per 10,000; negro females, 14.9 per 10,000. The rate of prevalence among children under 10 years of age and among adults aged 45 years and older is practically equal in the two sexes. The rate of prevalence drops among males between the ages of 19 and 45, whereas for females there is a remarkable excess of prevalence between these ages. In both males and females there is a striking fall in prevalence between the ages of 10 and 20 years.

The most significant fact with regard to occupation is the excessive prevalence of pellagra among women employed in housework. The excessive prevalence of pellagra in the mill-village population is found largely among women and children at home during the day. Among actual mill-workers the rate of prevalence between the two sexes appears to be about equal. One-half of the cases occurred singly in one family; about one-fourth occurred two in one family; the remaining fourth occurred in groups of three, four or five in one family.

The question of the possible relative importance of family relationship and household association is still under investigation. Among cases occurring singly in families, the proportion of children of both sexes under 10 years of age is low and that of adult females excessively high. Among cases occurring two or more in one family the proportion of young children is proportionately high, especially among males. While apparently authentic sporadic cases of pellagra within the county can be traced back to as early as 1894, the disease does not appear to have occurred in any great number of cases in any year until 1908. Since 1908 the incidence-rate appears to have rapidly increased each year to 1911. The number of new cases

developing in 1911 appears to have been slightly greater than in 1912. There was no evidence pointing to any spring and fall recrudescence of the disease in the population so frequently referred to in the literature of pellagra. There is no particularly marked tendency for the seasonal recurrence to appear in an individual during the same month, year after year. Climatic conditions appear to influence the development of symptoms of the disease. If during the spring months precipitation is high, temperature low, and number of rainy days excessive, the appearance of acute symptoms, more particularly those involving the skin, is delayed.

It would appear that three or four years ago a large proportion of the cases observed in the county presented intestinal and nervous symptoms which were quite mild, and sometimes were confined almost exclusively to the cutaneous system, the disease appearing to be of a less virulent type in 1912 than in previous years. In the majority of cases (83 per cent.) economic conditions are poor and the disease is most prevalent among people of insufficient means. General health conditions in childhood do not appear to warrant consideration as etiologic factors when the disease develops in adult life. In a number of cases the development of pellagrous symptoms in children was preceded by one of the acute exanthematous diseases of childhood. About one-fourth of the cases gave a history of a preceding chronic disease in adult life.

In more than one-half of the cases (62 per cent.) most affected were married women (86 per cent.), and 86 per cent. of the married women had borne children. A history of illness immediately preceding the development of pellagra was elicited in 59 per cent. of the cases.

The most insanitary condition found in the county is the absence of properly constructed privies. Outside of a part of the city of Spartanburg which is supplied by a water-carriage sewage system, there is no effective provision in the county for the proper disposal of human excreta. A second striking unsanitary condition is the almost complete absence of effective screening of dwellings. These two conditions present a situation highly favorable to the transmission of disease organisms eliminated in the excreta, both by direct contamination of food and person and by insects. This situation is naturally aggravated in the mill-villages and small towns by the greater congestion of houses. The absence of effective screening for dwellings gives rise to conditions conducive to the possible transfer of diseases transmitted by biting insects.

Observations on the habitual use of the more common foodstuffs failed to discover any points of difference between pellagrins and non-pellagrins in the county or any facts which would seem to explain the strikingly greater prevalence of pellagra among certain classes of the population. The most striking defect in the general dietary of the working classes, appears to be the limited use of fresh meats, the animal protein being supplied largely in the form of cured meats, of which salt pork (especially bacon) is the most important. Unhygienic preparation of food appears to be a probable important factor in the general health of the population. Investigation of the kind, quantity, and quality of corn and corn products used in the county failed to bring to light any epidemiologic evidence pointing to the agency of corn as an etiologic factor in the disease. The presence of two cases in their series giving a definite history of no corn consumption within two years prior to the onset of symptoms, together with several other cases in which corn products were eaten, if at all, only in small quantity and at extremely rare intervals, would seem to argue strongly against any hypothesis that corn products alone are the causative agent of the disease.

Annals of Ophthalmology, St. Louis

July, XXII, No. 3, pp. 437-615

24 Retinal Detachment. R. Kuemmel, Erlangen, Germany.
25 Melanotic Sarcoma of the Choriold, with Apparent Secondary Involvement of the Retina. G. F. Keiper, Lafayette, Ind.
26 Value of Prisms in Ophthalmic Practice. W. Reber, Philadelphia.
27 Color Adaptation. F. W. Edridge-Green, London.
28 Use of Conjunctival Flap in the Treatment of Corneal Infections and of Pannus. E. G. Starr, Buffalo.
29 Case of Macular Mole. A. C. Sautter, Philadelphia.

Boston Medical and Surgical Journal

August 7, CLXIX, No. 6, pp. 181-220

30 Surgeon and Ptosis Problem: a Review. F. B. Lund, Boston.
31 *Rôle of Gastric and Intestinal Stasis in Some Cases of Epilepsy. H. Powers, Brooklyn, Mass.

31. **Gastric and Intestinal Stasis in Epilepsy.**—In the study of many cases of epilepsy in young children at the Children's Hospital, Powers came to believe that the gastro-intestinal disturbance preceded the epilepsy and was not merely a symptom. It must be admitted, he says, that the vast majority of individuals who suffer from stasis do not have epilepsy, but in his experience they do have headache, vertigo and other nervous symptoms caused by the toxemia that results from stasis. These symptoms of toxemia are of all shades of severity so that sometimes the diagnosis between these conditions and epilepsy is made with great difficulty and, it may be said, arbitrarily. Powers feels that in so-called "idiopathic" epilepsy the essential lesion is not in the nervous system. If it be true that epilepsy does not imply a defective central nervous system with a tendency to degeneration in the cells of the cortex and consequent mental deterioration, then the social status of the epileptic will have to be reconsidered. Laws designed to prevent the propagation of epilepties should then be so phrased as not to bar from marriage those in whom the disease is curable and probably not transmissible as such. A law barring from marriage the syphilitic, the alcoholic, the feebleminded and the insane would in effect bar those epileptice who ought not to be permitted to marry.

Finally, if it can be definitely established that the phenomenon known as "idiopathic," "inorganic" or "true" epilepsy is produced by a toxemia and that this toxemia is the result of stasis in the gastro-intestinal tract, the prognosis should be much better than it is at present, provided that the physician be equipped, not with drug therapy alone, but also with a knowledge of mechanical therapeutics, and that he use the bromids only as an adjunct to other treatment. A new exercise and a new method of self-massage for the treatment of stasis will be described in a subsequent paper.

Colorado Medicine, Denver

August, X, No. 8, pp. 229-254

32 Influence of Mental Attitude in the Treatment of Diseases of the Organs of Respiration and Circulation. E. J. A. Rogers, Denver.
33 Unstable Lung Capillary in Asthma. W. V. Gage, Primero, Colo.
34 Neurologic Notes. G. A. Moleen, Denver.
35 Skin Blemishes as Sites of Origin of Malignant Growths. A. J. Markley, Denver.
36 Simple and Accurate Method of Standardizing Vaccines. W. Burdick, Denver.
37 Infantile Cerebral Palsy. L. W. Ely, Denver.

Delaware State Medical Journal, Wilmington

July, IV, No. 8, pp. 1-26

38 Progress in Orthopedic Surgery. J. K. Young, Philadelphia.

Iowa State Medical Society Journal, Clinton

August, III, No. 2, pp. 73-145

39 When the Blind See. M. K. Heard, Iowa City.
40 Experience with Salvarsan. C. Van Epps, Iowa City.
41 Medicolegal Aspects of Fractures. J. W. Osborn, Des Moines.
42 Treatment of Puerperal Infections. G. A. Field, Des Moines.
43 Brain Syphilis. E. R. Posner, Des Moines.
44 Acute Osteomyelitis. C. S. James, Centerville.
45 Hodgkin's Disease. E. E. Wuttke, Sumner.
46 Diseases of the Nervous System in Children. R. W. Sleeter, Rockford.
47 Practical Points on Blood-Pressure. T. Dulin, Sigourney, Iowa.

Journal-Lancet, Minneapolis

August 15, XXXIII, No. 16, pp. 445-473

48 Early Diagnosis of Cancer. M. MacGregor.
49 Carcinoma of the Uterus. J. Farrage, Deering, N. Dak.
50 Recent Research on the Treatment of Cancer. A. O. Aaker, Velva, N. Dak.
51 Causes and Prevention of Acquired Deafness. J. D. Lew, Minneapolis.
52 Transposition of Viscera. G. A. Landmann, Scotland, S. Dak.
53 Removal of a Stick-Pin from the Second Bifurcation of the Right Bronchus by Direct Bronchoscopy Under Local Anesthesia. J. S. Macnie, Minneapolis.

Medical Record, New York

August 23, LXXXIV, No. 8, pp. 323-368

54 *Inheritance of Epilepsy. D. Hecht, Chicago.
55 Feeble-Mindedness and Schoolchildren. E. B. McCready, Pittsburgh.
56 Uterine Syndrome. G. K. Dickinson, Jersey City, N. J.
57 Landry's Paralysis with Report of Case. H. W. Jones, Utica, N. Y.
58 Prolonged-Precipitate Parturition Due to Disengagement of Disproportionate Head. A. E. Gallant, New York.
59 *Appendix Free in Abdominal Cavity without Suppurative Peritonitis. J. Wagner, New York.
60 Traumatic Bilateral External Rectus Paralysis, with Transient Paresis of Left Facial Nerve. E. A. Shumway, Philadelphia.
61 *Sphygmomanometer of New Principle. G. Van N. Dearborn, Cambridge, Mass.

54. **Inheritance of Epilepsy.**—In summarizing the facts which to him seem worthy of emphasis in a discussion of the inheritance of epilepsy Hecht urges that human society must concern itself more and more with the qualities in man that are physical and vital, as opposed to those that are mental and moral. In heredity we find the most potential factor in the evolutionary process of man. Environmental influences may modify but do not increase our original endowment. The essential thing in the preservation of the race is physical fitness, and inheritance, in its turn, is the essential and most to be desired thing in the development of such fitness. The methods with which we are to-day better able to explain the qualities and attributes inherited by man are perhaps those referred to as mendelian and biometric. It should, however, be thoroughly understood that no biologic phenomena, either in full or even in large part, meet the theoretic expectations of either method. The inheritance of epilepsy, however, is very worthy of being subjected to an analysis. Mendelian or biometric, in the hope that valuable data may be secured and in the end enable us to invoke the proper measures against the spread of the disease. The studies already made Hecht regards as highly instructive and suggestive, although there are many sources of error which to them seem almost impossible to overcome. Society has the moral right to interfere with the continuance of any human stock definitely known to be unalterably unsound and on the assumption that an overwhelming proportion of epileptics are of this type, the plan of segregation, efficiently and scientifically carried out, is a just one. The act of sterilization in the light of present knowledge is still open to criticism and objection and may, therefore, be considered premature and as a measure of legislative interference should not be endorsed. The mildly inferior epileptic constitutes a very great menace and one concerning which scientists are not prepared to make recommendation.

59. **Appendix Free in Abdominal Cavity without Suppurative Peritonitis.**—The appendix in Wagner's case was free of its cecal attachment, without any evidence of a purulent peritonitis, the exudative condition present being due to a carcinosis. The separation is explained by the pathologic condition in the appendix. The lumen was entirely occluded, probably involving the blood-vessels at the base to such an extent that sloughing was the natural sequence, the occluded lumen preventing infection of the peritoneal cavity. Omentum, bladder, rectum, intestines, and parietal peritoneum, all showed evidence of involvement.

61. **Sphygmomanometer of New Principle.**—Dearborn's sphygmomanometer consists merely of a properly adapted distal end-piece of an ordinary stethoscope firmly attached by a screw-thread to a spring-dynamometer with a transparent handle by means of which it may be grasped readily and pressed against the artery by the observer.

New York Medical Journal

August 23, XCVIII, No. 8, pp. 353-400

62 Topography of Bladder, with Special Reference to Cystoscopy. V. C. Pedersen, New York.
63 Modern Diagnosis and Treatment of Gynecologic and Obstetric Patients with Syphilis. J. B. Squier, New York.
64 Surgical Indications of Certain Gastro-Intestinal Symptoms. J. Douglas, New York.
65 *Importance of Serologic Analyses in Neurology. D. M. Kaplan, New York.
66 *Respirator: Appliance for Resuscitation by Producing Enforced Artificial Respiration; Report of One Hundred and Sixty-Three Experiments. H. E. Tompkins, New York.
67 Cesarean Section with Hysterectomy in Cases of Positive Infection. J. F. Baldwin, Columbus, Ohio.
68 Appendix and Some of Its Diseases. H. H. Hielscher, Mankato, Minn.
69 Carbon, Oxygen, Hydrogen Group, Plus Nitrogen or Non-Nitrogenized and Nitrogenized Food. J. C. Densten, Scranton, Pa.
70 Case of Septicopyemia. W. B. Coffey, G. R. Carson and W. T. Cummins, San Francisco.
71 Some Reasons for Advising No Delay in Operating All Forms of Hernia. J. Frankel, New York.

65. **Serologic Analyses in Neurology.**—As the result of his research Kaplan found that the Wassermann reaction is not present in the spinal fluid in all cases of syphilitic and parasyphilitic disease of the central nervous system. The use of increasing amounts of spinal fluid for the Wassermann test (*Auswertungs Methode* of Hauptmann) is a procedure capable of giving rise to non-specific inhibition in patients who did not come in contact with this disease. Serologically all nervous diseases are divided into two general and easily distinguishable classes, the negative and positive types. The negative type represents the non-luetic nervous diseases, the positive type the syphilitic and the parasyphilitic diseases. In the positive type group further differentiation is possible by serologic investigation in cases in which physical differentiation is difficult, such as between general paresis and cerebrospinal lues. Active and proper treatment markedly alters serologic pictures in many of the positive types. Such alteration may go on to any extent, even to the reduction to a complete negative picture. The greatest change to the negative occurs in cerebrospinal lues and the least in general paresis. In the cell-count in tabes may be found an index for or against treatment. Fully developed general paresis is best left untreated. Spinal cord compression from tumors or other causes shows a protein excess and an absence of pleocytosis.

66. **Respirator.**—The respirator devised by Tompkins is not cumbersome and heavy; in fact, it can be carried in a small case and weighs less than ten pounds. It does not depend on any brand of oxygen, nor does its operation depend on compressed gas. It is operated by hand and foot in the least tiring manner; both hand and foot can be changed without losing time or causing trouble. Its apparent initial cost is low, and it has no cost of upkeep. Finally, it makes use of air. If it is desired oxygen may be employed, or a combination of oxygen with a definite proportion of carbon dioxid, but Tompkins uses atmospheric air of which there is always a plentiful supply.

The technic is as follows: With the patient lying down, the shoulders are raised by means of a pad, so that the head falls well back. The mouth is opened and a prop or gag placed between the jaws. False teeth or other loose articles are removed from the mouth. Grasp the tongue and draw it, even strain it, well forward, pulling it as far as it will go. Pass the finger down the throat and swab out any mucus that may be present, and draw the epiglottis against the base of the tongue. The tongue, being held as well forward as possible, the mask, is adapted to the face. With the tongue between the mask and the chin, and held firmly in place by a piece of gauze, strap the mask to the face; it must be very tight, so that no air may leak in or out. These details having been observed, the mask is connected to the valve mechanism by a piece of rubber tubing from eight to twelve inches long. The valve mechanism is connected by more tubing to a pump or bellows of some description. All connections being well made and tight, the bellows is pumped and air forced along the tubing through the valves into the lungs. By pressing down on the valve stem, the air in the lungs is forced out into the atmosphere by the elasticity of the lung tissue. The valve stem is allowed to rise, and air is again admitted to the lungs. The raising and lowering of the valve stem controls the number of respirations allowed per minute. On the valve mechanism is found a safety valve which controls the pressure of air. When the pressure of air in the lungs reaches a predetermined point, as set for on the index, this valve allows the excess air

to pass into the atmosphere, and thus keep the pressure down to where it can do no harm. This is all there is to the machine.

Mississippi Medical Monthly, Vicksburg

August, XVIII, No. 4, pp. 65-86

72 Immunity. W. A. Dearman, Long Beach.
73 Care of Mouth During Sickness. J. H. Brown, Newton.
74 Some Pathologic Conditions Following Typhoid, with Report of Case. E. S. Bramlett, Osford.

New Orleans Medical and Surgical Journal

August, LXVI, No. 2, pp. 93-172

75 Clinical Studies in Pituitary Irritation with Report of Case. L. J. Genella, New Orleans.
76 Ocular Complications of Measles. C. A. Bahn, New Orleans.
77 Fly and Its Extermination. G. C. Chandler, Shreveport, La.
78 New Health Commandant. O. Dowling, Shreveport, La.
79 Case of Pellagra Treated with Salvarsan. D. W. Kelly, Winfield, La.
80 *Legislation—State and Local: What It May Accomplish for Sanitation. S. D. Porter, New Orleans.
81 Malaria in Louisiana. J. H. White, New Orleans.
82 Anomalies of Sacrolumbar Articulation. E. S. Hatch, New Orleans.
83 Neutrophil Leukocytic Picture as Guide for Tuberculins. W. J. Durel, New Orleans.
84 *Ehrmann's Palmin Tests. J. A. Storck, New Orleans.
85 Vicissitudes of Scrofula. A. J. Delcourt, Houma, La.

80 and 84. Abstracted in THE JOURNAL, May 10, p. 1487.

Public Health Journal, Toronto

August, IV, No. 8, pp. 443-488

86 Does Vaccination Protect? J. Roberts, Hamilton, Ontario.
87 The Scope of Sanitary Work in the Home. C. A. Hodgetts, Ottawa.
88 How Can Cross-Infection Be Prevented in a Hospital for Communicable Diseases? M. B. Whyte, Toronto.
89 Sanitary Work among the Foreign Population. C. N. Laurie, Port Arthur, Ontario.
90 Suppression Preferable to Segregation. J. L. Beavers, Atlanta, Ga.
91 What New Zealand Does to Promote the Health of the Women and Children. Mrs. Massey.

Vermont Medical Monthly, Burlington

July, XIX, No. 7, pp. 157-182

92 Diagnosis and Treatment of Syphilis. J. Daland, Philadelphia.
93 Ehrlich Remedy in Treatment of Syphilis. J. Daland, Philadelphia.
94 Value and Meaning of the Wassermann Reaction. E. H. Buttles, Burlington, Vt.

West Virginia Medical Journal, Wheeling

August, VIII, No. 2, pp. 37-70

95 Carcinoma of the Stomach from a Surgical Standpoint. R. E. Venning, Charlestown.
96 Urologic Diagnosis. E. O. Smith, Cincinnati.
97 Importance of the Early Recognition of Surgical Lesions on the Liver and Bile Ducts. C. R. Ogden, Clarksburg.
98 Etiology of Milium. G. A. Aschman, Wheeling.
99 Local Anesthesia in the Radical Cure of Inguinal Hernia. T. K. Oates, Martinsburg.
100 Treatment of Arteriosclerosis. L. F. Bishop, New York.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 2, No. 2744, pp. 213-284

1 Influence of the British Medical Association in the Establishment of Ophthalmology as a Special Science. T. H. Bickerton.
2 *General Toxic Effect of Paints. B. Moore, G. F. Oldershaw and O. T. Williams.
3 *Influence of Copper on the Growth of Mouse Carcinoma. A. J. Gelarie.
4 Eugenics. E. Schuster, H. Campbell and J. S. Macintosh.
5 Crime and Punishment. J. Scott, C. A. Mercier and B. Donkin.
6 Hospitals in Relation to the State, the Public and the Medical Profession. B. Moore.
7 The Municipal Hospital in Germany. I. G. Gibbon.
8 The German Hospital in its Relation to the Medical Profession. W. Pfeiffer, Essen, Germany.
9 The German Hospital and German Insurance Legislation. Grober, Jena.

August 9, No. 2745, pp. 285-318

10 Medical Prognosis: Its Methods, Its Evolution, Its Limitations. A. Chauffard.
11 Realignments in Greater Medicine: Their Effect on Surgery and the Influence of Surgery on Them. H. Cushing.
12 Pellagra in Great Britain. L. W. Sambon.
13 Abscess due to Streptothrix Eppingeris Resembling a Staphylococcic Infection. W. B. Alcock.
14 Treatment of Chronic Progressive Diseases of the Spinal Cord by Roentgenotherapy. F. H. Johnson.
15 Work of the British Red Cross Society's Units with the Bulgarians. E. T. F. Birrell.
16 The Relation of Utility of Aeroplanes in Connection with Medical Services in the Field. J. D. F. Donegan.
17 Spinal Analgesia in Military Service; 600 Cases. J. W. Haughton.
18 Use of Kinesitherapy in the After-Treatment of Injuries Received in War. Durey.
19 A Proposed Light Ambulance for Yeomanry Regiments. D. G. Kannard.
20 Fungous Infections of the Glabrous Skin. H. G. Adamson.
21 Veronal Rashes; with a Note on Luminal. G. Parnet.
22 The Nature, Varieties, Causes, and Treatment of Lupus Erythematosus. J. M. H. MacLeod.

2. **General Toxic Effect of Paints.**—The authors conclude from their experiments that there is no poisonous emanation from either basic lead carbonate or basic lead sulphate, even with much more thorough exposure than would occur to painters, or occupants of a freshly painted room, under ordinary conditions. The animals were exposed within a few inches of a freshly painted surface surrounding them on all four sides and roof as well. They believe that it may be taken that true lead poisoning when it does occur arises from swallowing, inhalation as dust followed by swallowing, or absorption from skin or an abraded surface, and not from volatile emanations.

3. **Influence of Copper on the Growth of Mouse Carcinoma.**—In one series of animals a solution of a cuprammonium sulphate was injected subcutaneously into tumor mice; in the second colloidal copper was employed. Cuprammonium sulphate ($CuSO_4.4NH_3.H_2O$) was obtained by adding to a saturated solution of $CuSO_4$ strong ammonia and then boiling; the blue crystals of the cuprammonium salt, which separated out on cooling, were dissolved in 0.85 per cent. NaCl solution and used for injection, the concentration of the solution employed ranging from 0.62 per cent. to 0.70 per cent. of metallic copper. The lethal dose of this salt was found to be represented by about 0.05 gm. of copper per kilogram of body weight. The injections were made subcutaneously at a distance from the tumor. Only mice with small tumors were employed for experiment, and spontaneous retrogression of mouse tumor has been in experience an excessively rare event.

The results of the experiments made with the cuprammonium sulphate: The number of injections varied from two to five. The injections, which frequently caused inflammatory swelling, sometimes leading to necrosis of the skin at the site of injection, were always made as far as possible from the tumor so as to avoid any direct effect on the growth. In three cases complete disappearance of the tumor occurred, and in two other cases great diminution in size took place. In five experiments the tumor remained stationary for periods varying from five to ten days, and in the remaining two experiments an increase in size of the tumor attended with softening took place. With a view of avoiding the local inflammatory reaction which occurs when cuprammonium sulphate is used, it was determined to employ colloidal copper for subcutaneous injection. This was observed to be slowly absorbed without producing a marked irritating effect. Colloidal copper was prepared after Bredig's method, a galvanic current of 10 amperes being allowed to pass between two thick copper electrodes immersed in a beaker containing distilled water, free from CO_2, placed in a larger vessel filled with ice. In this way a colloidal solution of copper was obtained containing 0.04 to 0.3 per cent. of copper. It was found that the colloidal solution could be boiled without precipitation occurring, and when air was excluded no change in the aspect of the liquid occurred in the course of several days. In all the experiments made, however, the colloidal solution of copper was freshly prepared.

The addition of stains, such as methylene blue, eosin, and basic fuchsin, in small quantity, was found not to precipitate copper from solution. A solution of colloidal copper is incom-

patible with saline solutions. A very small quantity of sodium chlorid solution, for example, causes precipitation almost immediately. It was, therefore, used in a non-isotonic solution, the injections being slowly made into the subcutaneous fascia in amounts of about 1 c.c., in several areas removed as far as possible from the tumor in order to avoid a direct effect of the copper; in some cases intraperitoneal injections were employed (1 c.c.), or both methods of injection were used. The minimal lethal dose of colloidal copper was not determined. In all thirty-two experiments were made, the number of injections in individual mice ranging from two to seven. In these experiments it was found possible to keep the animals alive a much longer time than was the case when cuprammonium sulphate was employed. Nevertheless, the number of cases in which complete disappearance of the tumor was obtained was relatively less than in the preceding experiments. In the greater number of experiments in which an effect on the tumor was observed this was manifested by the tumor becoming stationary in growth.

The effect on the implanted tumor of injection of colloidal copper was much less pronounced than when cuprammonium sulphate was used. Some of the stationary tumors were kept under observation for a very much longer period of time than in the preceding experiments. In one case the tumor remained stationary for as long as three months. In four experiments repeated intravenous injections of colloidal copper were employed. The amount of fluid injected always exceeded 1 c.c. and in one case reached as much as 2 c.c. After the latter injection the mouse became collapsed with rapid and deep respiration, subsequently recovering and surviving for forty-two days. With this exception no ill effect followed on injection. After intravenous injection the implanted tumors increased slightly in size during the next few days, and then became soft, subsequently remaining stationary. On sectioning these tumors very marked degeneration was observed. The results obtained in this and the preceding section show that by means of injection of copper-containing fluids implanted tumors in a certain proportion of cases pass into a stationary condition or undergo regression, and suggest that a similar result might be obtained in cases of spontaneous carcinoma.

Journal of Tropical Medicine and Hygiene, London

August 1, XVI, No. 15, pp. 225-240

23 A Year's Anti-Malarial Work at Khartoum. A. Balfour.

Lancet, London

August 2, II. No. 4692, pp. 273-362

24 Tuberculosis of the Urinary Tract. J. H. Evans.
25 *Fatal Illness in Children Associated with Acute Interstitial Parotitis. M. H. Gordon.
26 *Production of Ulcer of the Stomach in the Rat. C. Singer.
27 Arsenic Cancer. W. H. Nutt, J. M. Beattie and R. J. Pye-Smith.
28 New Guaiacol Chlor-Iodid Compound in the Treatment of Various Conditions. J. Maberly.
29 Laryngectomy Subsequent to Tracheotomy for Epithelioma of the Larynx. D. McKenzie.
30 Case of Lightning Stroke, Followed by Recovery. W. Gem.

August 9, II, No. 4693, pp. 363-444

31 *Value of Tuberculin in Pulmonary Tuberculosis. J. K. Fowler.
32 *Place of Tuberculin in Treatment in Relation to other Methods. W. C. White.
33 *Tuberculin Treatment. D. Sahli.
34 Electrography for Clinical Purposes. A. D. Waller.
35 Albumin Reaction in Sputum: Its Significance and Causation. H. A. Treadgold.
36 Basophile Patches in the Protoplasm of the Neutrophile Polymorphs. A. Roemmele and R. Sweet.
37 Syphilitic Infection Followed by Landry's Syndrome and Later by Tabes Dorsalis. E. D. MacNamara.
38 "Chronic Irritation" Caused by Fumes and Dust Produced in the Process of Manufacturing Tin Plates. H. C. Ross and J. W. Cropper.
39 Case of Volvulus of the Small Intestine Complicating General Peritonitis; Recovery. C. W. Cunnington.
40 Prevalence of Chronic Gastric Disease in Spain. W. A. Mackay and I. MacDonald.

25. **Fatal Illness in Children Associated with Acute Interstitial Parotitis.**—Gordon's communication is the histologic observation of an unusual lesion—parotitis—in a series of four cases under observation in the postmortem room at St. Bartholomew's Hospital during the past few months. All of the patients in question were children. All had died after a short illness in which the symptoms pointed to meningo-encephalitis. Post-mortem meningeal congestion was found in all the cases, and in two of them there was flattening of the convolutions and other evidence of increased intracranial pressure. In all alike no pus was present in the meninges. There was no evidence of tubercle in the meninges, brain or elsewhere. The cerebrospinal fluid was clear and contained an excess of lymphocytes, but no visible bacteria. Sections of the cerebral cortex and of the cord failed on microscopic examination to yield histological evidence to justify a diagnosis of poliomyelitis.

As regards the rest of the body, the lymph-nodes both in the neck and mesentery were swollen. In two cases the lymphoid tissue in the small intestine was more prominent than usual, this change being most marked in Peyer's patches in one case, and in the solitary follicles in the other. In two of the cases petechial hemorrhages were seen; in the first in the parietal pleura and visceral pericardium, and in the second on the under surface of the liver and beneath the capsule of the kidneys. In all the children both heart's blood and cerebrospinal fluid failed to show growth on agar, and their illness would have remained a mystery had it not been for the following observation: Although the salivary glands were not obviously enlarged and had given rise to no symptoms, they were found in all the four children to show on histologic examination foci of acute inflammation—chiefly interstitial in distribution. The duration of their illness had varied. In one case the child died within twenty-four hours of the onset, and clinically it was a case of "convulsions." The others died on the second, third and twelfth day respectively. The illness from which these patients had suffered presented certain features of general similarity. In point of fact, as a result of the first two cases the last two had been suspected clinically of being instances of this disease. Three out of the four patients had drowsiness as a well marked initial symptom. All developed coma. One had delirium.

In all of the cases the eyes were sunken and fixed or staring, but not to one side; their axes were parallel—that is to say, there was no squint. In all the pupils were dilated. In none was any abnormality made out with regard to the disk. All of the cases presented the symptom of muscular rigidity in some form or other. In two the head was definitely retracted, and all had some stiffness of the neck muscles. Kernig's sign was positive in three. Three of the patients had twitching and two had "fits" of more or less general muscular rigidity, in course of which they died. Babinski was present in two cases, doubtful in one, and absent in one. Three of the patients lost their knee-jerks and the reflex from their abdominal muscles. The children had a marked pallor. All of the cases had pyrexia, and all had a frequent and feeble pulse. All of them had a certain amount of vomiting and diarrhea, the stools of three of them being of a greenish color. The cerebrospinal fluid was under increased pressure. On examination an increase was found in the cells, the number counted being 50,446, and 6,800, respectively, per cm. in three of the cases. In all the cases the predominant cells in the cerebrospinal fluid were lymphocytes. As regards the blood, the leukocyte count was 11,400. A differential count showed a well marked lymphocytosis.

26. **Ulcer of the Stomach in the Rat.**—The line of experiment that ultimately proved successful in Singer's work was very simple. Rats were placed in circular earthenware jars, ten animals in each jar. At the bottom of the jars were placed wood shavings contaminated by other rats, and throughout the experiment the shavings remained unchanged. The animals were fed only on wet bread. It was always found that in the course of a few hours the bread became contaminated with fecal matter, and in a few days was also overgrown with moulds. The majority of animals dealt with in this way were found to present more or less marked gastric changes of ulcerous nature when the treatment had been

continued for a fortnight or longer. In eighty rats thus treated for ten days or more ulcers were found in fifty-seven cases, or 71 per cent., while in 200 well-kept rats that were used as controls ulcers were encountered in only sixteen cases, or 8 per cent. Experiments were also made in feeding well-kept rats on bread mixed with stale feces and on bread that had become mouldy, but negative results had been obtained. In the case, however, of fourteen well-kept rats fed once on a mixture of bread and minced intestines of other rats ulcers were found after four weeks in ten cases, or 72 per cent. The actual causative factor remained in doubt. The condition of experiment suggests an infective agent of the nature of an organism normally present in some other part of the digestive tract.

31. **Tuberculin in Pulmonary Tuberculosis.**—The use of tuberculin in any form in the treatment of pulmonary tuberculosis, Fowler says, is not free from danger. Even with exceedingly small initial doses which are gradually increased the limit of tolerance may be suddenly reached and a reaction may occur. Its use is absolutely inadmissible in any case in which there is fever. Fever is the guide to the activity of the disease, therefore, the rôle of any remedial agent which can only be employed in afebrile cases is necessarily very limited. General reactions should be avoided. If one occurs the treatment should at once cease. To continue tuberculin injections with increasing doses in spite of reactions is unjustifiable and dangerous to the life of the patient. Focal reactions are also dangerous, as they cannot be controlled. They may also occur in the neighborhood of obsolete lesions, such as it is the object of all treatment to produce. Fowler has reported a case in which, under treatment with old tuberculin a patient expectorated four calcareous particles, one of which was surrounded by pigmented lung tissue, and also a small portion of lung tissue. Subsequently signs of excavation appeared at the apex of one lung. Calcareous particles are "sleeping dogs" which should not be disturbed. The treatment likely to be attended by the best results should follow the lines of rest and exercise originated by Dr. Otto Walther at Nordrach, and further developed by Dr. Marcus Paterson at the Frimley Sanatorium of the Brompton Hospital.

32. **Tuberculin in Treatment in Relation to Other Methods.**—White believes fully in tuberculin as an aid to treatment in tuberculous cases. He is himself a subject of tuberculosis and has for seven years taken tuberculin in some form or dose at least every two weeks, probably in all over 500 doses. It has done him no harm that he is conscious of. On the other hand he has been sure that it has done him great good when he has taken enough at one time to produce in his body a mild reaction. In small doses he has never been able to notice the slightest influence. White has now watched many patients who have taken tuberculin steadily for periods varying from two to five years—cases of tuberculosis of the eye, of bones, of glands, of skin and throat—and the improvement in many cases of them was due to tuberculin and to tuberculin mainly. However, the last dregs of the disease are always very hard to remove, and there is probably some other factor, he says, which we have not yet learned which must be added to tuberculin before we have a real specific for this disease.

33. **Tuberculin Treatment.**—Sahli is an ardent advocate of the tuberculin treatment and gives fifteen propositions in support of his position: All the various tuberculins are essentially identical. The apparent differences are dependent on the various degrees of admixed impurities. The active principle of all tuberculins is the protein of the tubercle bacilli. There is no proof of the existence of a tuberculin exotoxin. The fact that it is impossible to produce high sensibilization for tuberculin by previous tuberculin injection in healthy animals is no argument against tuberculin being actually the toxin of tuberculosis. The best tuberculins are those prepared from cultures as free as possible from adventitious albumins. To avoid disastrous mistakes in the therapeutic dosage it is advisable to provide the practitioner with tuberculin in suitably graduated dilutions. The use of tuberculin for diagnostic purposes ought to be condemned. It is unreliable both positively and negatively. Diagnostic injections are dangerous. The only diagnostic procedure Sahli advises is the cutaneous reaction with graduated dilutions. Its purpose is not diagnosis in the ordinary sense, but the determination of tuberculin sensibility in order to fix the proper initial dose for treatment. Tuberculin treatment is free from danger only if more obvious clinical reactions are avoided. In advanced cases tuberculin treatment may sometimes produce a certain symptomatic effect, but this effect does not compare with the utility of tuberculin in incipient cases.

In order that tuberculin treatment should be widely available for the most favorable incipient cases, it is indispensable that the general practitioner, and especially the family physician, should render himself proficient in tuberculin treatment. Correct tuberculin treatment is only possible if based on a solid and thorough knowledge of the action of tuberculin. The theory of the therapeutic action of tuberculin may now be regarded as well established. Tuberculin acts favorably only in cases where the human organism is not already sufficiently under the influence of absorbed tuberculin; that is, generally in slighter cases. It is not necessary to increase the doses of tuberculin to the furthest limit of tolerance. Many cases improved more with a much smaller dose. This optimum dose ought not to be overstepped. The large doses of tuberculin recommended recently for the purpose of reducing temperature have no curative action. Tuberculin has not the character of a true immunization, though it produces immunizatory effects in the organism. All localized tuberculosis is suitable for tuberculin treatment, provided that the patient's system is not already overloaded with tuberculin, and he is, therefore, too seriously ill. As a rule acute cases cannot be treated by tuberculin.

Tuberculin by means of multiple cuti-reactions after the method described by Sahli at the International Congress on Tuberculosis in Rome, 1912, has been proved harmless, and especially for incipient cases. It is based on the principle of enlarging the reactive surface. The strongest local (cutaneous) reaction is produced with the smallest amount of tuberculin. Well-diluted tuberculin treatment constitutes a real and great therapeutic progress.

Archives Générales de Chirurgie, Paris

July, VII, No. 7, pp. 769-896

41 Congenital Scoliosis Connected with Deformed Vertebra. L. D. Chambardel.
42 Firearm Wounds of the Chest. (Plaies thoraciques par armes à feu pendant la guerre Italo-Turque.) F. Caccia.
43 Cancer of the Breast with Calcareous Concretions. (Le cancer psammeux du sein.) T. P. Tourneux and Bassal.

Archives des Maladies du Cœur, etc., Paris

August, VI, No. 8, pp. 497-560

44 Neuromuscular Heart Block; Three Cases. (Dissociation auriculo-ventriculaire d'origine neuro-musculaire.) A. Souques and D. Routier.
45 Sclerosis of Pulmonary Artery Secondary to Certain Chronic Lung Conditions. (Cardiaques noirs.) F. C. Arrillaga.

Presse Médicale, Paris

July 30, XXI, No. 62, pp. 625-632

46 *Percussion Sign of Typhoid Fever. (La submatité de la base droite—submatité rétrohépatique—signe de fièvre typhoïde.) C. Lesieur and J. Marchand.
47 Malformation in Palate, etc., as Affecting Development of the Teeth. (Quelques mots d'orthodontie à l'usage des médecins.) L. Frey.

46. **Percussion Sign of Typhoid Fever.**—This sign was described in THE JOURNAL, March 30, 1912, p. 979. Lesieur and Marchand now have a record of 150 cases in which the test for it has been applied. In eighteen the findings were negative and the cases proved to be not typhoid. In one case there was no localization of the typhoid in the intestines, the symptoms being meningeal and septicemic, but the percussion sign was positive and thus was the guide to the diagnosis, confirmed by the course of the case. The sign

is seldom positive in the later stages of the disease and it was never encountered in other infectious diseases. The reappearance or persistence of the sign after the temperature has returned to normal warns of impending relapse. The sign is an area of relative dulness on superficial percussion of the right base of the thorax. It is not to be found on the left side, and, if there are no lesions in the pleura or lungs to explain it, this dulness may be accepted as differentiating typhoid. They regard the dulness as the expression of the exaggerated antitoxic function of the liver in typhoid. No other infectious disease seems to affect the liver and the rest of the biliary apparatus to such an extent as typhoid.

Semaine Médicale, Paris

August 6, XXXIII, No. 32, pp. 373-384

48 Professional Secrecy in Matters Involving Workmen's Compensation. (Le secret professionnel en matière d'accidents du travail.) M. Bourdon (Conseiller à la Cour de cassation).

Berliner klinische Wochenschrift

July 28, L, No. 30, pp. 1381-1420

49 *Acute Articular Rheumatism. (Pathogenese des akuten Gelenkrheumatismus.) W. Weintraud.
50 *Exercise in Treatment of Circulatory Disturbances. (Die Bewegungskur bei Kreislaufstörungen.) E. Zander, Jr. (Stockholm).
51 Symbiosis of Plants with Bacteria. (Einige Fälle von Symbiose höherer Pflanzen mit Bakterien.) W. Benecke.
52 Feeding through Duodenal Sound. (Dauerernährung mittels der Duodenalsonde.) P. Lazarus.
53 Roentgenoscopy of a Woman whose Stomach and both Vagus Nerves had Been Resected. M. Cohn.
54 Operative Cure of Tumor in Gasserian Ganglion. B. Sachs and A. A. Berg (New York).
55 *Saphenofemoral Anastomosis in Treatment of Varices. M. Weichert.
56 *Test for Iodin in Urine. R. Ehrmann.
57 *Serous Meningitis in Puerperium Simulating Brain Tumor; Recovery. (Ueber einen im Wochenbett unter dem Bilde eines Hirntumors mit Ausgang in Heilung aufgetretenen Krankheitszustand.) A. Pelz.

49. **Pathogenesis and Treatment of Acute Articular Rheumatism.**—Weintraud presents arguments to sustain the assumption that the parenteral passage into the blood of bacterial proteins or of substances originating under the influence of the bacteria, create conditions of anaphylaxis. The parenteral penetration into the system of the bacterial proteins thus sensitizes the organism, and a special affinity of these proteins for the joints or the heart may lead to a special local sensitization. The specific reaction soon dies out, but new generations of bacteria repeat the process. Other bacteria may then get in their work as a complicating secondary infection. This conception of the origin of acute articular rheumatism throws light on the treatment. Weintraud continues. All the drugs which are known to be effectual in acute articular rheumatism are mild narcotics for the sensory functioning of the brain. It is certainly remarkable that the drugs with most effectual action are those which attenuate the sensory impulses from the joints. Some of them are actual anesthetics for the joints. We know that the outbreak of the symptoms accompanying the anaphylactic reaction in animals can be entirely prevented by general anesthetics (ether, ethyl chlorid, etc.). There is also much research on record which shows that the phenomena of inflammation, otherwise inevitable, do not occur if the sensory impulses from the region are attenuated or entirely suppressed.

50. **Gymnastic Exercises in Circulatory Disturbances.**—This address by E. Zander, Jr., was the principal one at the recent physiotherapy congress at Berlin. He declares that the method of therapeutic exercises, Swedish movements, etc., is of long tried efficiency, but that the theories with which its effects have been explained have been outgrown. A new theory must be built up; it must be based more on the biologic effect than the mechanical; more on the after-effect than on the action at the time; more on the effect on the periphery than on the center. In other words, the main task of therapeutic exercises is to draw on and train the muscles and the lungs in the task of compensation.

55. **Saphenofemoral Anastomosis in Treatment of Varices.**—Weichert has applied Delbet's technic slightly modified in five cases, in two on both sides. The results were less favorable than anticipated. All the patients were improved, but not to the hoped-for extent. The mediocre effects realized were out of all proportion to the severity of the operation.

56. **Test for Iodin in Urine.**—Ehrmann uses substances which practitioners are liable to have already on hand. About 2 c.c. urine are placed in a test-tube; 1 c.c. of dilute hydrochloric acid is poured into the tube and then 0.5 c.c. of commercial hydrogen dioxid (3 per cent.). The iodin released is shown up by addition of 1 c.c. toluol or 1 c.c. chloroform and the whole shaken up. A red layer of toluol floats on top, or there is a deep red layer of chloroform beneath.

57. **Serous Meningitis in the Puerperium Simulating Brain Tumor.**—Pelz reports the case of a young, otherwise healthy woman in an apparently normal puerperium, who suddenly developed headache, vertigo, vomiting, apathy and other signs of a brain tumor, the pulse 44, choked disk, the cerebrospinal fluid under high pressure, but no localizing symptoms. Then followed a stage of general convulsions, agraphia and apraxia, but improvement soon became manifest and the cure was complete in four or six weeks. Oppenheim reported a similar case with necropsy, and Nolen has published a case in which the same syndrome developed at the twelfth pregnancy and returned at the fourteenth and fifteenth, but the woman recovered. There can be no doubt of the connection between this periodically recurring, tumor-suggesting syndrome and the pregnancy or puerperium. The trouble is evidently a serous meningitis due to some intoxication connected with the pregnancy. We must not be too hasty to ascribe the recovery to decompressive operations in such cases. If an operation had been done in any of the above, the improvement would certainly have been attributed to it. A decompressive trephining was contemplated in Pelz' case but was constantly postponed. This patient had a history of intense headache, during her first childbed, coming on suddenly and persisting.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 2, XLIII, No. 31, pp. 961-992

58 *Diagnosis of Perforated Gastric Ulcer; Six Cases. (Zur Diagnose des plötzlich in die freie Bauchhöhle perforierenden Magengeschwüres.) H. Ryser.

58. **Differential Diagnosis of Perforating Gastric Ulcer.**—Ryser's patients were three men of 22, 39 and 48 and three women of 46 to 63. The perforation was surrounded by indurated tissue, showing that the ulcer was of the callous type, boring deep, in all the cases. Sudden intense pain was the first symptom but there was actual collapse only in two of the cases. In most cases the pain and tenderness are at the seat of the perforation but other patients refer the pain to the ileocecal region, misleading the physician to assume appendicitis. This occurs when considerable stomach content has escaped through the perforation and has spread downward. Vomiting seldom occurs as the vomiting movements of the stomach force the contents through the perforation instead of up to the mouth. The physician finds the patient generally in bed, lying motionless on his back, in great distress from the pain. The face is pale and covered with cold sweat. Later, patches of red may be seen in the face and the extremities are cyanotic, showing that the organism is suffering severely from the intoxication. In two of his cases the pulse kept good and strong for several hours; in the others it grew fast and small at once. The temperature may be normal or above or below. The breathing is rapid and shallow. In one case hiccough came on in a few hours. A history of gastric trouble suggesting ulcer is a great aid in differentiating, as also the boat-shaped retraction and rigidity of the abdominal wall. If only a small amount of stomach content escapes, the abdominal wall may not grow rigid, but in his cases the rigidity was pronounced or could be elicited by light pressure on the abdomen. The liver dulness was normal in three cases, much reduced in one case, normal at first but absent

an hour later in another, and in the sixth there was no area of dulness over the liver. A perforating appendix never causes such intense pain from the start, and the rigidity is more apt to be restricted to that half of the abdomen. A ruptured pyosalpinx in another case simulated the picture of a perforated gastric ulcer, especially as the young woman had long suffered from dyspepsia and had even taken a course of treatment for gastric ulcer, while there was no history of gynecologic trouble. The operation revealed the stomach intact.

Deutsche medizinische Wochenschrift, Berlin

July 24, XXXIX, No. 30, pp. 1441-1488

59 Combined Treatment of Syphilis. (Ueber die Heilung der Syphilis durch die kombinierte Salvarsan-Quecksilberbehandlung.) W. Scholtz and E. Riebes.
60 Psoriasis is a Clinical Entity. (Ist die Psoriasis ein Symptom chronischer Infektionskrankheiten—Tuberkulose, Syphilis?) W. Schoenfeld.
61 *Serotherapy of Skin Diseases. (Ueber Serumbehandlung von Hautkrankheiten.) G. Stümpke.
62 *Artificial Light in Treatment of Surgical Tuberculosis. R. Hagemann.
63 Perception of Light and of Colors. (Vergleichende Untersuchungen über den Licht- und Farbensinn.) F. W. Fröhlich.
64 *Influence of Experimental Thymectomy on Growth. (Ueber die Thymusdrüse.) K. Basch.
65 Pathology of the Knee. F. Bähr.
66 *Pyelitis and Otitis Media in Infants. F. Glaser and H. Fliess.
67 Rhinoliths. (Zwei bemerkenswerte Fälle von Nasensteinen.) O. Heinemann.

61. **Serotherapy of Skin Diseases.**—Stümpke has been applying transfusion of serum or whole blood in quite a number of cases and obtained very favorable results in itching eczema, in lichen ruber planus and herpes gestationis and in urticaria, while the results were sometimes good and sometimes negative in parasitic eczema, pemphigus and psoriasis. Some of the cases had proved refractory to all other measures. The favorable effect was realized only in the skin affections with a general cause and not of purely local origin. As a rule, he injected on an average 20 or 25 c.c. of serum after defibrination and centrifugation of the blood, repeating the infusion two or three times at intervals of from three to five days.

62. **Artificial Light in Treatment of Surgical Tuberculosis.**—Hagemann's article issues from König's clinic at Marburg and a communication from König, himself, was recently summarized in these columns July 26, 1913, p. 314, bearing on the same subject, namely, the fine results obtained with the mercury quartz lamp, exposing the whole body as in Rollier's method of utilizing the direct sunshine in the Swiss mountains. Hagemann emphasizes that the results with this artificial sunlight are so good and the method is so cheap and easily applied anywhere, without the necessity for long sojourns away from home, it permits the poorest to have the advantage of the therapeutic application of the chemical rays.

64. **The Thymus Gland.**—The untimely death of Karl Basch put an end to the important researches of which this is his last report. It is illustrated and shows the great difference in development between puppies of the same litter when the thymus was removed from some of them. The results demonstrate further that the thymus is involved not only in the growth of the bones and the eyes and in the excitability of the nervous system, but that it has some close connection with the lymph system.

66. **Otitis Media and Pyelitis in Infants.**—Glaser and Fliess have encountered three cases which have convinced them that otitis media is extremely liable to accompany pyelitis or precede it, and should be suspected even when there are no manifest signs of ear trouble whenever the fever keeps high. In one case the colon-bacillus pyelitis was evidently a complication permitted by the general debility resulting from the unsuspected otitis media; the child recovered its health after paracentesis and the cure of the otitis. They reiterate that when an infant has fever although it seems to be explained by discovery of pyelitis, yet the greatest attention should be paid to the ear. Otitis media may be the primary trouble even although there are no signs of it to be detected, no bulging of the drum, no redness and no tenderness in the mastoid. If the membrane shows any signs of redness they urge to incise it at once. The pyelitis in such cases is merely secondary, the result of mixed infection.

Medizinische Klinik, Berlin

July 27, IX, No. 30, pp. 1191-1232 and Supplement

68 *Sweating Procedures in Internal Medicine. (Bedeutung von Schwitzkuren.) A. Schwenkenbecher.
69 Gynecology and Psychiatry. O. Bumke.
70 *Anesthesia at Delivery. (Narkose und Anästhesie bei Geburten.) H. Fuchs.
71 *Multiple Sclerosis. (Eine praktisch und theoretisch wichtige Verlaufsform der multipien Sklerose.) R. Brandt and S. Auerbach.
72 Hemorrhage after Abortion and Delivery. (Blutung post abortum et post partum.) M. Schechner.
73 Physical Measures in Treatment of Chronic Bronchitis and Emphysema and the Secondary Circulatory Disturbances. A. Haupt.
74 Mineral Mud and Other Baths in Gynecology. (Ueber die Bäderbehandlung der weiblichen Sterilität.) O. Daude.
75 *Mode of Action of Saline Purgatives. (Wirkungsweise salinischer Abführmittel.) Best.
76 Treatment of Heart Disease. (Zur Therapie bei Herzkranken.) G. Liebermeister.
77 Radiology of the Stomach. (Neuere Ergebnisse der Radiologie des Magens.) Hurter.

68. **Sweating Procedures in Internal Diseases.**—Schwenkenbecher concludes his remarks on this subject with the statement that the systematic use of hot water baths may prove a great help in various diseases. The baths can be modified as to the amount of water, the temperature and the duration of the bath so as to adapt them to a delicate constitution and a weakened circulatory system. In kidney disease the sweating procedure diverts the fluid from the edema to the skin, and thus benefits, but the assumption that large amounts of nitrogen and chlorids can be eliminated in the sweat is not justified by the facts. Although a little more is thus eliminated in the sweat of nephritics than of healthy persons, yet the total is comparatively small. Even an energetic sweating bath cannot wash out more than 1 gm. of nitrogen and 2 gm. of sodium chlorid in this way, and in the individual case the question must be thoroughly studied whether this compensates for the demands made on the system by the sweating procedure. Hot local baths, hot baths for the feet or hot packs for the trunk in case of uremic headache and nausea, often have a marked influence on the symptoms of nephritis. But even with these it is of the utmost importance, as with all sweating procedures, to see that enough fluid is ingested or supplied in some way to take the place of that lost in the sweat. It may be wise also to place a cooling appliance on the heart. He says that bacteria can pass from the blood into the sweat, but that this occurs extremely rarely. He thinks that in syphilis sweating procedures are not applied as often as they should be for the tertiary, torpid syphilids of the skin and mucous membranes, and torpid bone lesions. Baths facilitate the mercurial inunctions. On the other hand, he warns emphatically against sweating procedures in syphilitic nervous affections, as they are liable to aggravate them. He remarks that in applying heat or hot baths in treatment of chronic arthritis the intensity of the heat applied is an important factor in the results; the action is more rapid and more intense the hotter the bath. Baelz has called attention to the fact that certain thermal springs with a temperature of 54 C. are the most effectual of all in Japan in the treatment of chronic joint disease.

70. **Anesthetic for Delivery.**—Fuchs relates a number of experiences which sustain his general conclusion that up to the present no means is known of rendering delivery painless which is not fraught with some danger. He says of the scopolamin "twilight sleep" that it is so dangerous for the respiration center of the fetus that he has abandoned it entirely. In his service one otherwise normal child succumbed evidently to the "scopolamin trauma" alone, and three others were born with lagophthalmos, cyanosis, sluggish pupils and very slow respiration, but these three children finally threw off the effect of the drug after a week of som-

noleney, taking scarcely any nourishment. He cites a case to show the medicolegal complications possible when a woman is delivered during the "twilight sleep": When the woman returned to full consciousness and found twins beside her, she refused to accept the two infants as her offspring. The accusation of changing the children while the mother is unaware of what is going on is also within the possibilities.

71. **Onset of Multiple Sclerosis with Visual Disturbances.**—Auerbach and Brandt call attention to their experience with a group of fourteen cases in which the first signs of anything wrong were visual disturbances, headache and dizziness. Although vision was much reduced, the ophthalmoscope revealed little if anything abnormal, and the visual disturbances gradually subsided. In 80 per cent. of the cases only one eye was affected. Moving the eyeball around and pressure on it elicited pain. The periphery of the field of vision was not altered but there was almost absolute scotoma for red and green and relative for white. The diagnosis was retrobulbar neuritis, and under mild inunctions and sweating procedures vision returned to normal in three or four weeks in the majority. In about 12 per cent. of the cases optic atrophy developed and the papilla was blanched even in the cases with good functional outcome. Neurologic examination revealed in nearly every instance symptoms suggesting incipient multiple sclerosis, including nystagmus, intention tremor and modification of the reflexes, but no tendency to scanning speech, tenesmus or disturbance in the gait. Fleischer has reported that among forty-two cases of retrobulbar neuritis, this proved in 66 per cent. to be the first symptom to attract attention to oncoming multiple sclerosis. This was the case in 45 per cent. of the thirty-seven cases of retrobulbar neuritis reported here. Some of the patients were kept under supervision and there was an interval of years, up to fifteen years, before the multiple sclerosis induced very serious symptoms. In many instances three to six years afterward the patients were still able to attend to business. The cases commencing with visual disturbances seem to have an unusually protracted course. Auerbach and Brandt add that a recent letter from Miura of Japan confirms the rarity of multiple sclerosis in Japan. Miura has never encountered it in the thousands of necropsies at his institute. They state further that they have been told that the western coast of America seems also to be free from it; in any event, it is far less common in America than in Europe.

75. **Salt Solution as a Purgative.**—Best reviews his experiences with some dogs with Pawlow fistulas. The results also show, he says, that physiologic salt solution passes through the gastro-intestinal tract without irritating it or interfering with osmotic conditions, while there is nothing he knows of which is passed along so rapidly. His clinical experience confirms these experimental findings. He had patients drink two glassfuls of a 0.9 per cent. solution of sodium chlorid, twenty minutes before breakfast. After nine or twelve minutes defecation followed. The stomach expels the salt solution remarkably promptly, setting up peristalsis throughout the intestinal tract. In the dogs 1 liter of the salt solution passed entirely through the alimentary tract and was expelled in thirty minutes, unless the animals were thirsty; in this case part of the fluid was absorbed. The larger the amount ingested the more rapid the passage. Most mineral waters are hypertonic and are absorbed in the duodenum unless large quantities are taken. The accumulation of the fluid in the lower bowel has a purgative influence and this is supplemented by the peristalsis reflex emanating from the stomach. After drinking the salt solution on an empty stomach in the morning he has the patient follow it with a cup of coffee or other appetizing drink. With atony of the stomach, the rapid expulsion of the physiologic salt solution makes it the only regulator of the bowels to use, he declares.

Münchener medizinische Wochenschrift

July 29, LX, No. 30, pp. 1641-1696

78 *Serodiagnosis of Bovine Tuberculosis. (Ueber die Verwendbarkeit der optischen Methode und des Dialysierverfahrens bei Infektionskrankheiten. Untersuchungen über Tuberkulose bei Rindern.) E. Abderhalden and P. Andryewsky.

79 Serodiagnosis of Abnormal Thymus Is Practicable. (Gelingt es mittels der Abderhaldenschen Fermentreaktion, den Nachweis eines persistierenden oder hyperplastischen Thymus zu führen?) K. Kolb.

80 Serodiagnosis of Cancer and Pregnancy. (Die Diagnose der bösartigen Neubildungen und der Schwangerschaft mittels der Abderhaldenschen Methode.) G. v. Gambaroff (Moscow).

81 *Ileus and Appendicitis. W. Wiegels.

82 *Seasickness and Vagotony. J. Fischer.

83 *Treatment of Burns. (Ueber Verbrennungen, nach Rovsings Methode behandelt.) O. Wulff.

84 Application of Pressure and Suction in Various Fields of Medicine. (Druck- und Saugbehandlung in der ärztlichen Praxis.) F. Kirchberg.

85 *Albuminuria and Hematuria after Hexamethylenamin. (Ueber ungünstige Wirkungen des Urotropins.) W. Cuntz.

86 Treatment of Granulating Wounds. A. Wittek.

87 Hereditary Chorea. (Kasuistischer Beitrag zur Chorea chronica hereditaria.) M. Goldstein.

88 Typical Injury of Middle Condyle of the Femur. P. Ewald.

89 Syphilitic Pernicious Anemia. J. Weicksel.

90 Negative Pressure in Long Bones of Dogs. (Ueber negativen Druck in den langen Röhrenknochen des Hundes.) M. Rothmann.

78-80. **Abderhalden Serodiagnosis in Infectious Disease, Etc.**—Abderhalden and Andryewsky report experiences which suggest the possibility of diagnosing infectious diseases by means of the optic and dialysis biologic method, possibly also determining the special organs involved. The question is now to learn whether the defensive ferments involved are an aid or detriment to the organism. They possibly may be instructive for the prognosis. Their presence indicates at least that the organism is defending itself. The response to the test after injection of tuberculin may prove especially important in testing cattle. This communication deals principally with the application of the test to bovine tuberculosis. A negative response was constantly obtained in healthy animals (50), positive in fifteen experiments after injection of a suspension of killed tubercle bacilli, as also in eight cases in which healthy animals had developed experimental tuberculosis.

Gambaroff reports from Moscow forty-eight cases of cancer and thirty-seven other cases in which the Abderhalden technic was applied, including twenty-two pregnant women and ten normal persons. The tabulated details show remarkable concordance, constantly negative responses in the normal serum and constantly positive in all the others, with the single exception of a syphilitic who gave a positive cancer reaction.

81. **Ileus and Appendicitis.**—Wiegels reports nine cases in which the ileus developed in consequence of appendicitis although in some of the cases the interval since had been many years, up to seventeen in one instance.

82. **Seasickness and Vagotony.**—The condition of atony of the vagus nervous system, called "vagotony" by Eppinger and Hess, was mentioned in THE JOURNAL August 16, 1913, p. 520, abstract 80. Fischer calls attention to the remarkable similarity or identity of the symptoms of seasickness with those of typical vagotony, and urges treatment of seasickness on the principles which have been found effectual in treatment of vagotony, that is to say, injection of atropin. He describes extensive experiences on a stormy passage across the Atlantic last winter. He found that persons with the signs of vagotony were more liable to develop seasickness than others. In fifty-two severe cases of seasickness he gave a subcutaneous injection of atropin in a dose of 0.001 gm. to men and 0.00075 gm. to women. All the symptoms of seasickness had generally disappeared by the end of three or four hours, only in very exceptional cases was a second injection necessary. In one group of eight very seasick persons given the injection, all felt entirely well the next morning except two who were only much improved, while a similar group not given any treatment had their seasickness continue unmodified. The harmlessness of the atropin in this dose, he says, is beyond question. By the mouth a good effect was apparent in thirty cases, but it was less pronounced and slower in developing. The dose by the mouth was twenty drops of a 1 per thousand solution. He explains how nearly all the symptoms of seasickness can

be traced to irritation of the vegetative nervous system, and this he ascribes to the movements of the boat.

83. This is the same article as the one reviewed in Abstract 138 below.

85. **By-Effects of Hexamethylenamin.**—Cuntz warns that this drug (urotropin) cannot be regarded as absolutely harmless. With the usual dosage he has witnessed hematuria and albuminuria develop in two cases. In the first the bladder was evidently seriously irritated; in the second case albuminuria, leukocytes and epithelial cells were found in the urine after administration of hexamethylenamin, subsiding on suspension of the drug and returning on its resumption.

Petersburger medizinische Zeitschrift

July 28, XXXVIII, No. 14, pp. 163-173

91 *Febrile Abortion. (Bericht über 593 Aborte mit spezieller Berücksichtigung der Therapie des fieberhaften Aborts.) A. Waeber.
92 *Uterine Cancer in the Riga District. (Zur Statistik des Karzinoma uteri.) B. Herzfeld.

91. **Treatment of Abortion.**—Waeber states that in 90.4 per cent. of the 593 cases of abortion reported the women had normal temperature throughout, while 9.6 per cent. had fever after evacuation of the uterus. The total mortality was 0.67 per cent., but in only one case was the fatality due to infection from the genital organs and in this case the abortion had been induced by the woman herself with a nail. He makes a practice of clearing out the uterus at once, and all the patients in the uncomplicated cases recovered. He says that bacteriologic findings are of no moment, for almost any of the germs in the vagina are liable to become virulent under favoring conditions, and that there are only two signs of unusual virulence which can be depended on, namely, when one of the germs crowds out all the others in the cultures, and when the germs in the blood proliferate so rapidly that the blood looks as it if were laked.

92. **Cancer of the Uterus.**—Herzfeld states that in ten years at the dispensary connected with the city hospital at Riga (Russia) the uterine cancers formed 1.9 per cent. of the 7,947 cancer cases in women and the operability was 37.2 per cent. up to 1909. Since that date it has been over 47 per cent., showing that the systematic campaign of education then started is beginning to have some effect. In addition to the above, there were 195 with uterine cancer among the 3,939 cancer cases admitted to the hospital. Of the total material, 4.2 per cent. were in women between 20 and 30; 8.9 per cent. between 60 and 70, and 2.1 per cent. between 70 and 80. Most of the women had borne four or five children, but in 8.7 per cent. the women were nulliparae or virgins. The latter group includes two women under 30. In the inoperable cases the first signs of trouble had been noticed two weeks up to a year before in the majority, but in four cases the interval had been from two to ten years.

Therapeutische Monatshefte, Berlin

August, XXVII, No. 8, pp. 549-616

93 The Newer Proprietary Hypnotics. (Klinische und experimentelle Grundlagen der Schlafmitteltherapie.) A. Gregor.
94 *Treatment of Burns. (Behandlung der Verbrennungen.) S. C. Beck.
95 *Conservative Treatment of Scarlatinal Abscesses. (Ueber konservativ behandelte periaurikuläre, subperiostale Abszesse bei Scharlach.) Sörensen.
96 Slight Pharmacologic Action of Cereus grandiflorus. A. Grober.

94. **Treatment of Burns.**—Beck believes in keeping the surface moist to promote secretion and elimination. This renders disinfection of the burned area superfluous. He cuts off the blister epidermis and places the patient in a tepid bath for from five to thirty minutes. He is then returned to bed and the burned area is covered with several thicknesses of gauze dipped in a 1 to 4,000 or 3,000 solution of potassium permanganate, with rubber tissue or oiled silk over this. Every thirty minutes the impermeable covering is raised and fresh tepid permanganate solution is poured on the gauze, which is otherwise left undisturbed. When the general condition permits, he has the patient placed twice a day in a large bath tub of tepid water in which about 6 or 8 gm. of the permanganate has been dissolved. The dressing is not removed beforehand; it comes off of itself in the water. The patient is left in the bath for thirty or forty minutes if the heart permits. Beck gives heart tonics as needed and supplies fluids copiously internally. In the severe cases he allows no food but milk in small, frequent amounts. This treatment with wet dressings is kept up until the temperature is normal or nearly normal and the general condition manifestly improved. Then the area is treated with salve to hasten the healing.

95. **Conservative Treatment of Scarlatinal Abscesses.**—Sörensen states that an abscess developed near the ear in fifty-three of the 4,000 scarlet-fever patients at the Copenhagen Hospital. Treatment was by incision down to the bone, drainage, and rinsing out, with or without instillation of dilute iodin-potassium iodid solution and a cotton dressing. Of the fifty-two children treated in this way—fifty-seven abscesses—none died, although the scarlet fever in these cases had been of an unusually severe type and there were numerous other complications. In 100 cases at another institution in which radical operative treatment was applied, the mortality was 9 per cent. The general condition was good in 88.5 per cent. of Sörensen's cases with conservative treatment. The details of the more typical cases are given. Only three of the total number required a radical operation later.

Virchows Archiv, Berlin

CCXIII, No. 1, pp. 1-158

97 Encapsulation of Tuberculous Foci in the Liver. H. Jenny.
98 Digestive Diseases of Laboratory Animals. S. Saltykow.
99 Studies on Circulation. H. Ribbert.
100 Pathological Changes in Aorta of Horse not Analogous to Human Arteriosclerosis. (Pathologische Veränderungen der Aorta beim Pferde in Verbindung mit der Lehre der Atherosklerose beim Menschen.) W. D. Zinserling.
101 Alcoholic Cirrhosis of the Liver. M. Schafir.
102 Metastatic Carcinoma of the Prostate Simulating Lymphomatosis. C. Lungsgaard.
103 The Blood Platelets in Thrombosis. (Zur Frage der Thrombose.) R. Hanser.
104 *Changes in the Hypophysis in Diphtheria. G. Creutzfeldt and R. Koch.
105 New Formation of Skin over Myelomeningoceles. (Ueber nachträgliche Ueberhäutung von Myelomeningozelen.) M. R. Bonsmann.
106 Structure of Congenital Goiters. N. Krasnogorski.
107 Changes in the Myocardium in Epinephrin Poisoning. N. Anitschkow.

104. **Changes in the Hypophysis in Diphtheria.**—Creutzfeldt and Koch find that the circulation frequently fails in diphtheria before there are any clinical signs of change in the heart, and that on autopsy the heart lesions are frequently insufficient to account for the severe atony of the vascular system. They believe that the hypophysis is partly responsible for this atony, and their belief is confirmed by the marked rise in blood-pressure brought about by hypophysis extract. In seven cases of death from heart involvement in diphtheria, they found profound changes in the pars intermedia of the hypophysis. These same changes were produced in guinea-pigs by the injection of pure cultures of diphtheria bacilli. A combined epinephrin-hypophysis extract therapy should be used in cases of diphtheritic heart involvement.

Zentralblatt für Chirurgie, Leipsic

August 2, XL, No. 31, pp. 1209-1248

108 Nail Extension for Fractures. (Zur Technik der Steinmann'schen Nagelextension.) F. Steinmann, D. Kulenkampff and Petzsche

Zentralblatt für Gynäkologie, Leipsic

August 2, XXXVII, No. 31, pp. 1141-1180

109 *Cure of Uterine Cancer by Exploratory Curetting. (Heilung von Karzinom durch Probeauskratzung.) C. H. Stratz.
110 Bactericidal Action of Mesothorium. O. Bondy.
111 *Aseptic Means to Introduce Hand into Uterus. (Vorrichtung zur asceptischen Einführung der Hand in den Uterus.) R. Roosen.
112 *Torsion of Myomatous Uterus. H. Poth.

109. **Cure of Uterine Cancer by Exploratory Curetting.**—In the case to which Stratz refers, the exploratory curetting in

1886 revealed cancer but for six or eight years there were no further signs of cancer on repeated exploratory curetting, done every two years at the patient's request. The curet finally revealed microscopic cancer and vaginal hysterectomy followed at once, but not a trace of cancer could be discovered in the uterus. It seems evident that on both occasions the curet accidentally happened to remove all the cancer cells there were. In the similar case recently reported by Hess, with no sign of recurrence during the five years to date, hysterectomy may yet become necessary.

111. **Aseptic Means to Introduce the Hand into the Uterus.**—An open bag of rubber and an outer open bag of linen are both fastened to a wire ring about 10 cm. in diameter. The hand grasps the rubber bag inside the linen and the linen is drawn back over the hand like a cuff while the ring catches at the vulva and the hand pushes up the rubber bag inside and finally works through it as the cervix is reached. The surface of the rubber bag does not come in contact with the vulva at all, and the hand does not emerge from the bags until just ready to enter the uterus. An illustration of the contrivance is given.

112. **Torsion of Myomatous Uterus.**—In Poth's case a virgin of 56 had known for twenty-one years that she had a pelvic tumor, but as it had caused no disturbance she did not heed her doctor's advice to have it out. Five years after the menopause her abdomen began to enlarge and suddenly symptoms as of acute peritonitis developed. The pains increased after two days and the objective findings suggested torsion of an ovarian tumor but the uterus was found to be the organ involved. There was one quite large and two small myomas; the whole uterus weighed 3,750 gm. and it had twisted completely around. Poth knows of only eighty-two cases of the kind on record; in Kynoch's case the myomatous uterus weighed over 16 pounds and had twisted two and a half times around.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 24, XXXIV, No. 88, pp. 911-918

113 Industrial Accidents and Resulting Diseases and Workmen's Compensation. (Misura della guaribilita ed indennita relativa dei morbi dipendenti da infortunio sul lavoro.) G. M. de' Luna.

July 29, No. 90, pp. 935-942

114 *Prostatectomy. B. Cimino.

July 31, No. 91, pp. 943-950

115 Subphrenic Abscess after Appendectomy. (Di alcune forme di ascesso sotto-diaframmatico post-operatorio.) M. Fusano.

August 3, No. 92, pp. 951-966

116 *Hyperglycemia and Abnormally High Blood-Pressure with and Without Kidney Disease. (Ipergliccmia ed ipertensione.) A. Farini.

114. **Prostatectomy.**—Prostatectomy is a comparatively rare operation in Italy, and Cimino lauds its advantages, particularly when it is done by Freyer's technic and the cavity left is tamponed with strips of gauze drawn with a thread through a Freyer-Marion tube. He operates with the bladder empty.

116. **The Sugar in the Blood with Kidney Disease.**—Farini tabulates the findings in twenty patients with high blood-pressure. Ten had kidney disease and ten had pronounced arteriosclerosis. Some of the nephritic patients had an abnormally large proportion of sugar in the blood but others did not, and none of the arteriosclerotics had more than the normal proportion.

Policlinico, Rome

August 3, XX, No. 31, pp. 1102-1150

117 *Painful Epigastric Hernia as Sign of Gastric Ulcer or Cancer. P. Alessandrini.

July, Medical Section No. 7, pp. 289-336

118 *Rhizomelic Spondylosis. M. Magnini.
119 Pneumococcus Hemorrhagic Ulcerative Enteritis. (Contributo allo studio delle enterorragie pneumoniche.) D. De Sandro.
120 Tests for Pancreas Functioning. (Osservazioni cliniche sulla ricerca del succo pancreatico nell'intestino.) G. Plantoni.

117. **Palpation of the Epigastrium in Diagnosis of Stomach Disease.**—Alessandrini remarks that in the present enthusiasm for laboratory and biologic tests, we must not overlook the importance of palpation of the stomach. This alone may reveal trouble below, and careful palpation of the epigastrium should never be neglected in case of pain connected with digestion. In a case reported, a man of 59 for eighteen months had had oppression and pain in the epigastrium three or four hours after meals, relieved by an alkali. There was no free acid, no vomiting, eructation or black stools, but palpation revealed a very small tumor in the epigastrium on the median line. The tumor became extremely painful to touch during the attacks of pain in the stomach, and during exercise. Roth has reported the case of a patient with a similar syndrome who for seven years had wandered from doctor to doctor taking courses of treatment for gastric ulcer or gastric neurosis, until finally the discovery of a minute hernia on the median line in the epigastrium cleared up the diagnosis and its removal put an end to all disturbances. In Alessandrini's case the hernia was accompanied by a gastric ulcer and the two were removed together. He thinks they were of independent development but that the hernia became painful only after the ulceration had occurred, while possibly the course of the ulcer may have been aggravated by the coexisting hernia.

118. **Ankylosis of the Spine.**—Magnini reviews the cases on record of rhizomelic spondylosis and reports a typical case from his own experience. The patient was a man of 34 and the first symptoms of his trouble had been noticed at the age of 12. After five years of gradually increasing stiffness of parts of the spine, a period followed with pain at these points and also in other joints in which the osseous surfaces are united by elastic fibrocartilages or they have a capsule with synovial lining. Thus the vertebral bodies, shoulder, knee, sternoclavicular and temporomandibular articulations were the ones involved. Study of his case and those on record has revealed certain common features which suggest that the trouble is the result of abnormal function of the glands with an internal secretion, and hence that organotherapy has some prospects of success if given in time before irreparable lesions are installed. He thinks that thymus extract seems most promising. Surgical and orthopedic measures have never given more than temporary relief, confirming the assumption of a constitutional cause.

Riforma Medica, Naples

July 26, XXIX, No. 30, pp. 845-850

121 Transient Glycosuria in Acute Tonsillitis; Four Cases. C. Farmachidis.

Medizinskoe Obozrienie, Moscow

LXXIX, No. 6, pp. 471-558. Last indexed June 21, p. 198

122 Serotherapy of Tuberculosis. M. A. Brustein.
123 *Suture of Stab Wounds of the Heart. A. N. Drosdoff.
124 *The Wassermann Test in Cadavers. A. Abrikosoff.
125 Rupture of Aneurysm of Abdominal Aorta into the Stomach Through an Ulcer. S. M. Zipkin.
126 *Municipal Sanatoriums Versus Specific Treatment in the Control of Tuberculosis. Fuchs-Volfring.

No. 7, pp. 559-646

127 *Urobilinogenuria and Its Significance in Infectious Diseases. S. Kamsarakan.
128 Tests of Kidney Functioning. A. Savelieff.
129 *Polyneuritis after Salvarsan and Neosalvarsan. N. Solomin.
130 *Serodiagnosis of Echinococcus Disease. A. Abrikosoff.
131 Cancer of the Cecum. (K Kazuistike heterologitcheskikh kankroidov slepoi kishki.) Tezengauzen.

123. **Suture of Stab Wounds of the Heart.**—Since the suturing of wounds of the heart has become a common procedure, the mortality from such wounds has fallen from 85 per cent. in 1867 to 57 or 53 per cent. in the last few years. Drosdoff has collected 222 cases of cardiac wounds that have been treated by suturing, and 105 of the patients recovered. As the symptoms of stab wounds of the heart are not always clear, the subjective symptoms (general condition of the patient, dizziness, pain in the chest, cerebral manifestations), and the objective signs (hemorrhage, presence of a wound in the chest in the cardiac region, increased cardiac dulness caused by effusion of blood, and abnormal murmurs) being very inconstant, Drosdoff prefers to operate even when there

is a mere suspicion of injury of the heart, though a presumptive diagnosis can generally be made from a combination of different symptoms. In a large St. Petersburg hospital the diagnosis was made in eleven out of twenty-one cases. The operation consists in enlargement of the wound in the chest, resection of the corresponding ribs and, while the heart is fixed by the finger—which may also help to check the hemorrhage—a silk thread is passed through the epicardium and heart muscle, without waiting for diastole or systole. The suture thread must not be tied too tight. The pericardial wound he advises to leave open and tampon; this helps also in draining. If the wound in the pericardium is too large, a couple of stitches are advisable in addition to the tampon. The beneficial results are sometimes striking, no complications in the form of irregular heart action, or pericardial adhesions occurring, as Drosdoff's case shows.

124. **The Wassermann Test in Cadavers.**—Abrikosoff studied the Wassermann test on cadavers and reports the results of 104 tests. Of these 104 cases ninety-two belonged to different non-syphilitic diseases, such as tumors, diphtheria, kidney and liver troubles, etc., and in all these cases the reaction was negative. In the other twelve cases, two belonged to scarlet fever which gave a positive Wassermann reaction with a non-specific antigen (heart of a guinea-pig); the balance of ten showed syphilis either in the history, or in the pathologic changes of the tissues. The tested fluid was either the blood from the right heart and vena cava, or from the pericardium. The amount was 0.2 c.c. As antigen, an alcoholic extract of a syphilitic liver was used, or Landsteiner's antigen (heart of guinea-pig). Abrikosoff comes to the conclusion that the Wassermann test may be of great help to the pathologist in those cases in which a correct pathological diagnosis cannot be made, for instance, in cases of suspicious arteriosclerosis, aortic changes, chronic renal or liver lesions, etc.

126. **Municipal Measures for the Campaign Against Tuberculosis.**—Fuchs-Volfring discusses in this second article the advantages of specific treatment of tuberculosis as compared with the usual sanatorium treatment which, in his opinion, has given in Germany but meager results. (His first article on the subject was abstracted in THE JOURNAL, June 21, 1913, p. 1988.) The public sanatoriums as run at present in Germany, that is, admitting only the early, mild, curable cases, he regards as an anachronism and absurdity, but nobody there is bold enough to express such a view after the hundreds of thousands that have been spent on the sanatoriums. All the patients could have been given specific treatment in dispensaries, without stopping their occupation, and a far larger proportion of patients and the 7,000,000 marks could have been thus saved, or the places in the sanatoriums filled by the patients with early tuberculosis could have been taken by 36,000 spreaders of infection. He is convinced that with specific treatment in dispensaries 60 per cent. of those given treatment in the German sanatoriums could have been cured, instead of the mere 20 per cent. of cures that were realized.

127. **Significance of Urobilin in the Urine.**—Kamsarakan has been studying Ehrlich's benzaldehyd reaction indicating the presence of urobilin or urobilinogen in the urine. To 8 or 10 c.c. of urine are added five or seven drops of 2 per cent. solution of paradimethylaminobenzaldehyd. A cherry color indicates a strong positive reaction; a pink color turning red on heating indicates a mild reaction. Altogether 518 patients were examined, with results as follows: In 155 cases of scarlet fever, the reaction was positive in all; in eighty-four cases of diphtheria a positive result was obtained in fifty-one, and in all these cases there was a mixed streptococcus infection; in the rest (thirty-three cases), in which pure cultures of diphtheria bacilli were obtained, or mixed with staphylococci, the result was negative; of 101 cases of various forms of angina, seventy gave a positive reaction, and in these seventy cases streptococci were found. In the rest of the cases, in all of which staphylococci were found, the reaction was constantly negative. In 183 cases of erysipelas—a strictly streptococcus affection—the patients all gave a positive reaction, while in pneumonia (initial stage), typhoid fever, chicken-pox, mumps and measles the test proved negative or inconstant as also in tuberculosis.

As a rule the reaction seems to be positive in all streptococcus infections and it indicates functional insufficiency of the liver. Derangement of the liver is the cause of the urobilinuria or urobilinogenuria—which is practically the same—as the diseased liver cannot transform the urobilinogen formed in the intestines from the bilirubin and biliverdin of the bile. Therefore the urobilinogen passes into the blood and reaches the kidneys which eliminate this substance with the urine. In all diseases in which the liver is directly involved, as in streptococcus infections, pernicious anemia, etc., the reaction is positive, but shortly before death it becomes negative. Therefore Kamsarakan considers the Ehrlich test important not only for the diagnosis, but also for the prognosis. (For other communications on this test see THE JOURNAL, May 31, 1913, p. 1750; May 18, 1912, p. 1538, or July 22, 1911, p. 346.)

Simon regards the test as very important for differentiating organic abdominal disease from merely nervous disturbances. In a recent case a young man for years had had trouble indicating hyperacidity, and there was always a strong positive response to the test for urobilinogen. The symptoms became so severe that the patient clamored for an operation and an old duodenal ulcer was found. In two other cases of hyperacidity causing trouble the intense reaction to the test for urobilinogen proved to be a manifestation or consequence of gall-stone trouble. He adds that the simple and easy technic for the test can be applied so readily, even at the office, that he commends it for general adoption in case of doubt whether the gastric symptoms observed are of purely nervous origin or are the work of some organic affection. (Simon's article appeared in the *Med. Klinik*, 1913, ix, 1164.)

129. **Polyneuritis After Salvarsan.**—Solomin's patient received one injection of neosalvarsan and two injections of salvarsan in the usual doses, but all within three days. About four weeks later polyneuritis developed, first in the lower limbs, and then in the arms. The course was progressively subacute; finally slow improvement set in under the usual measures, massage, electricity, baths, etc. The clinical picture, typical for arsenical polyneuritis, the slow recovery without any specific treatment, such as mercury or salvarsan, indicate the etiology of the trouble in Solomin's case in the drugs administered. The patient had been treated long before she came under Solomin's care with plain injections of arsenic which, however, did not cause any bad effects, as compared with those from the salvarsan.

130. **Serodiagnosis of Echinococcus Disease.**—The serum of patients with echinococcus deviates the complement, which Abrikosoff could prove on five patients through subsequent operations. As an antigen the fluid from the echinococcus cyst was used, this being the only variation of Wassermann's test. The echinococcus fluid may be obtained from sheep, beef or men, the best being the sheep's fluid, but that of beef being the most available. The fluid is kept on ice in small sealed tubes, and keeps perfectly for three months. The dose of the fluid is 0.5—1 to 5 c.c. of the mixture. The dose of the patient's serum is 0.2 to 0.6 c.c., the average and sufficient amount being 0.4 c.c. Altogether the blood of thirty-one patients was tested, and all but five proved negative, and in these five the operation showed the presence of the echinococcus. Therefore, deviation of complement with specific echinococcus antigen speaks for echinococcus, and *vice versa*. Sometimes a negative reaction before the operation turns positive after the operation.

Brazil-Medico, Rio de Janeiro

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132 Research on Trypanosomes. (Nota sobre as schizogonias e gametogonias dos trypanosomos.) H. de B. Aragão.

Hospitalstidende, Copenhagen

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133 *Transplantation of Femur. (Et Tilfælde af fri Transplantation af Knogle fra et Menneske til et andet—Homoplastik—til Erstatning for den nederste Halvdel af Laarbenet.) T. Rovsing.

134 *Ileus with Congenital Malposition of the Large Intestine. (Tilfælde af Ileus ved medfødt Retroposition af Tyktarmen.) T. Rovsing.
135 *Petrolatum Injections in Treatment of Arthritis and in Prevention of Ankylosis. (Om Vaselininjektion i Leddene, dens Indikationer, Teknik og Resultater.) T. Rovsing.
136 *Leukoplakia in the Bladder. (Leukoplakia vesicæ.) A. Lendorf.
137 Tumor from Aberrant Dental Tissue: Three Cases. (Adamantinomer.) J. Ipsen.
138 *Treatment of Burns. (Om Forbrændinger behandelte efter Rovsings Metode.) O. Wulff.

133. **Transplantation of Femur.**—In 1909 Rovsing implanted a stretch of the patient's own fibula in the place of a stretch of the humerus in a man of 26. The bone healed perfectly in place and complete function was restored, but after about a year, in lifting a comparatively slight weight, the fibula fractured, showing that this bone is not strong enough to stand much strain. In a more recent case a woman of 25 required resection of the lower part of the femur; in both cases the bone had been the seat of a sarcoma. In this latest case he implanted at once a segment of an old humerus to keep the stumps apart until the danger of local recurrence had passed. Two months later he had to amputate the leg of a girl of 14 with myelitis and spastic paralysis of the legs. The thigh was amputated between the upper and middle thirds, and Rovsing left the rest of the operation to others while he, on another table, dissected out the femur, wrapped it in napkins dipped in warm salt solution, wrapping it further in oiled silk and then placing it in a metal box and speeding with it in an auto to the other clinic where the patient was already prepared for the implantation, so that he could begin it at once, only twenty minutes after the beginning of the amputation operation. The old humerus implant was removed; the periosteum on the lower end of the femur was loosened and about 2 cm. sawed off, which was also done for 1 cm. on the tibia. Both bones looked healthy. The limb was then stretched and the implant cut to fit the gap of 14 cm., each end being cut with a point to fit into the stumps. It was further fastened with four aluminum-bronze sutures. The patella was removed. A year has passed since the first operation and there has been no recurrence of the sarcoma. There is still a minute fistula where the drain tube had lain, but otherwise the results have been extremely satisfactory. The patient still wears a leather bandage and walks with two canes, but has long resumed her office work. Roentgenoscopy shows the implant solidly fastened in place with good callus at both ends.

134. **Ileus with Congenital Malposition of the Large Intestine.**—Rovsing reports two cases; in the first the woman had had no trouble from this retroposition of the colon until ileus suddenly developed at the age of 20. The operation showed the colon lay behind instead of in front of the small intestine, passing through an opening in its mesentery. In another case the anomaly caused no disturbance until the first pregnancy.

135. **Treatment of Arthritis with Petrolatum Injections.**—Nine years ago Rovsing called attention to the fine results he had obtained in two cases of traumatic arthritis in the hip joint in which he had injected yellow vaselin, curing at one stroke the chronic disturbances. He here states that the cure has been permanent during the eleven and nine years since to date, and describes his further experience with forty-four other patients, eight requiring injections on both sides. This experience, he declares, has confirmed the efficacy of the measure, realizing his highest anticipations. The aim is to supply a lubricant when the natural lubricant, the synovia, is missing on account of the degeneration or cicatrization of the synovial membrane. The method is therefore applicable only in simple dry synovitis or senile joint affections in which the synovial membrane has lost its secreting power. Another indication for the method—and he reports eight cases to illustrate its advantages—is when the vaselin is injected to prevent development of ankylosis after incision or resection of the joint. This group of cases shows that injection of vaselin can successfully prevent ankylosis after resection of a tuberculous joint process, when all the diseased tissue can be removed. Also when there is no infection and hence no need of drainage. When puncture shows that there is fluid present in the joint, of course injection of vaselin is superfluous and may do great harm, but in appropriate cases his success has been remarkable. One young man of 22, a sailor, had had trouble in his right hip joint since the age of 9 when this region had been injured in a wagon accident. The joint had long been painful and the neighboring muscles were atrophied. The capsule was punctured with a trocar through an incision 5 cm. long above the greater trochanter. No synovial fluid could be detected, and at once 25 c.c. of yellow vaselin was injected. The relief was immediate, complete and permanent so that six days later the man passed a severe examination for the position of able-bodied marine and did his work without disturbance of any kind, no one suspecting the previous joint trouble until the navy surgeon several months later accidentally discovered the little scar left from the operation. (Rovsing's previous communication on the subject, giving the details of the first two cases mentioned above, was summarized in THE JOURNAL, April 29, 1905, p. 1412.)

He uses a tube with metal cap which screws on the collapsible tube of vaselin, and boils the whole for fifteen minutes before the injection. The only dangers are embolism and infection. The former is prevented by using a blunt-pointed cannula and being sure that no blood escapes from it and that the point moves freely in the joint before the cannula is screwed to the 10 cm. long rubber tube connected with the vaselin. The amount of vaselin to be injected seems to be about 20 or 25 c.c. for the hip joint; not over 10, 12 or 15 c.c. for the knee; 15 c.c. for the shoulder.

136. **Leukoplakia in the Bladder.**—Lendorf's patient was a man of 66 who had signs of chronic cystitis and for ten years had occasionally passed in his urine cells of epidermis in horny degeneration. The cystoscope showed a patch of leukoplakia in the bladder. He was treated as for ordinary cystitis and refused operative measures. Lendorf knows of only thirty-one cases of leukoplakia vesicae in the literature. The symptoms are those of chronic pyuria with cystitis, probably a vicious circle.

138. **Treatment of Burns.**—Wulff reviews the experiences with sixty cases of severe burns treated by Rovsing's method. The main features of the method are that the region around is sterilized and then, under a few whiffs of ether, the burned area is cleansed with soap, alcohol and a mild antiseptic. The burned area is then covered with rubber tissue in which numerous small holes have been cut. The rubber tissue extends about a quarter of an inch beyond the edges of the burn, and above the rubber tissue is spread a layer of 1 per cent. silver nitrate gauze, dry, and above this again dry absorbent cotton, the whole held in place with a gauze bandage. This local treatment is supplemented with narcotics, stimulants and saline infusion as indicated. Under this treatment no contracture developed in any case. The secretions escape around the edges or through the holes and are absorbed by the medicated gauze and the area heals over in an almost ideal manner. In one case a young man had been extensively scalded with steam; this treatment was applied almost immediately and the burn had entirely healed by the seventeenth day. In another very similar case three days elapsed before this treatment was begun, and the burn was already suppurating profusely. Sixty-seven days were required in this case before healing was complete. In six fatal cases in which the urine had been examined, albuminuria was noted in all but one, while there was albuminuria in only two of the forty-nine patients who recovered (among those whose urine had been examined), and the albuminuria was very slight. Wulff thinks that examination of the urine is important for the prognosis of burns. As only the severest burns were admitted to the hospital, the eleven fatalities in the sixty cases he regards as a good record. No report is made on the numerous other cases of burns in out-patients.

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139 Dwarf Growth and Myxedema. (Dværgvækst og Myxodedem.) C. E. Bloch.